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ART BULLETIN NUMBER FIVE

FIGURE DRAWING

—Alfred Howell

DEPARTMENT OF EDUCATION, ONTARIO

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It is the hope of the Department of Education that the matter and the illustrations are sufficiently clear and simple to enable the individual to work out the elements of the subject himself.

Messrs. Ralph McMullen, H. McCrea, Herbert Palmer, Frank Carmichael, Arthur Lismer, Alfred Howell, and S. W. Perry have all had some part in the preparation of these Bulletins.

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FIGURE DRAWING

INTRODUCTION

There is perhaps no more fascinating study than that of the human figure. Its adaptation to the many and diverse forms of art makes the subject one of universal appeal.

The achievements of art in painting, sculpture, and design, leads one to the conclusion that the representation of the human figure ranks among the highest forms of expression. From the bas-reliefs of the Egyptians, possessing marvellous decorative qualities, the virile studies of the Assyrians, the grace and beauty of the figures from Greek vases, the power and strength of Michelangelo, the grace and fire of Leonardo, the sensitive line of Holbein, have come a wealth of material and inspiration.

The teaching of the human figure has proved to be among the most difficult of art subjects. The human figure can really be taught only from the living model, and no amount of book knowledge can make up for the loss of practice from the life. There are students who draw by instinct, and others who acquire knowledge and the capacity to draw after intensive study. However, there are comparatively few outstanding figure draughtsmen compared with those in other branches of draughtsmanship. This suggests that the subject is a very exacting one and requires long and continuous study.

Many valuable books on the subject have been written—many of them beautifully illustrated. One of the chief points considered in all of these is the extent to which anatomy should be taught. Whilst it is true that the structure of the human figure is dependent on a knowledge and an application of anatomy, it is also true that the subject has been somewhat overdone and has tended to exclude the more spontaneous efforts of the student. The history of art shows that some of the great draughtsmen possessed a consummate knowledge of anatomy, and that others possessed little. We recall that the great athletic sculptures by the ancient Greeks reveal such correctness of anatomical detail that the most punctilious modern anatomist could find no fault with them. It is a well-established fact that the Greeks had scarcely any knowledge of anatomy in the sense we understand it to-day. The great statues by Lysippus were the result of constant observation of figures in action, the constant attendance of finely developed youths at the gymnasium and Olympian games offering splendid opportunities to the artists in the understanding of proportion and action. If we can appreciate the conditions under which they worked in those days, we can readily see the reason for the extraordinary skill shown in the representation of the human form.

It is obvious that if we are to learn the secrets of the human figure, we must first be able to draw and pose figures, however crudely, in definite and lively action. The practical application of this idea was clearly demonstrated through the exhibition recently on view in Canada of the work of Viennese children. Not only did their work possess charm and power of design, but it possessed, also, an unusual grasp of the fundamental points of action, combined with technical skill.

The secret of learning to draw the figure in action was revealed nearly a century ago through the teaching of Baubadraun. He allowed his models to walk about, and insisted on his students seizing upon some characteristic pose and memorizing the same.

It may also be said of Rodin that he followed the same method. His quick sketches show how clearly he caught the essentials of movement, and how, by a few direct strokes of the pencil, he was able to convey a sense of completeness. The rapid sketches of Leonardo da Vinci show that he possessed a penetrating insight into human character.

It would appear that the fundamentals of anatomy may be understood and felt without making a drawing look like an anatomical chart and an exaggeration of muscular action.

There is only a limited number of bones and muscles that actually affect the outward form, and it is these essential structural features that we need to know. A simplification of this study is desirable, in order to secure a firmer grasp of proportion and action.

THE APPROACH TO STUDY

Knowledge of the human figure should be approached by the study of the principles that govern its construction and action, and by the application of those principles through constant practice in drawing both from the living model and from memory. Without a knowledge of construction one cannot build a superstructure. It is therefore obvious that a general knowledge of the skeleton is essential, the movement and action of the figure being dependent on this. There are artists who can make a superficially attractive drawing of a figure without knowing the skeleton; but the more searching aspects of the subject demand an intimate knowledge of those things that bring about changes and modifications according to varying actions. It is generally noticeable that a beginner's drawing is stiff and inactive and lacking in solid construction.

Since the artist is more immediately concerned with the external and apparent, he views nature as colour, tone, texture, and light and shade; but whether he be painter, sculptor, or illustrator, he requires a profound knowledge of those basic qualities of structure, action, and character.

When he considers the infinite variety of action, transitory movements, changes in light and shade, subtlety of form and colour, the average student often becomes fascinated and neglects to search for the cause. It is natural that, in his eagerness to arrive at the finality of a subject, an attempt at elaborate rather than a simplified rendering is the result in evidence. Thus we frequently find that in the drawing of a head, precedence is given to minor details rather than to the solid but somewhat hidden construction of the form. Certain details become emphasized out of all proportion to the rest of the head.

The theory of construction of the human figure by means of planes has been well expounded by Hutton and Vanderpoel. This simplified method eliminates much that is unnecessary and gives a clearer idea of the three dimensions of the human figure.

It is evident that the student passes through two stages in drawing the figure: First, the period of research, in which he analyses the figure in the large qualities of action, construction, and character, seizing upon the vital facts and conveying the impression of the whole. For this reason rapid sketches of a direct and simple nature are desirable. Unless this is done, one is apt to bring the figure down to a formula, developing a preconceived idea of what a figure is. The infinite variety of types demands the training of a keen observation. The fixed type is the easy way out of a difficulty; but when one meets the demands of modern expression, for instance in illustration, where variety of type is so essential, the student who has been trained in aca-

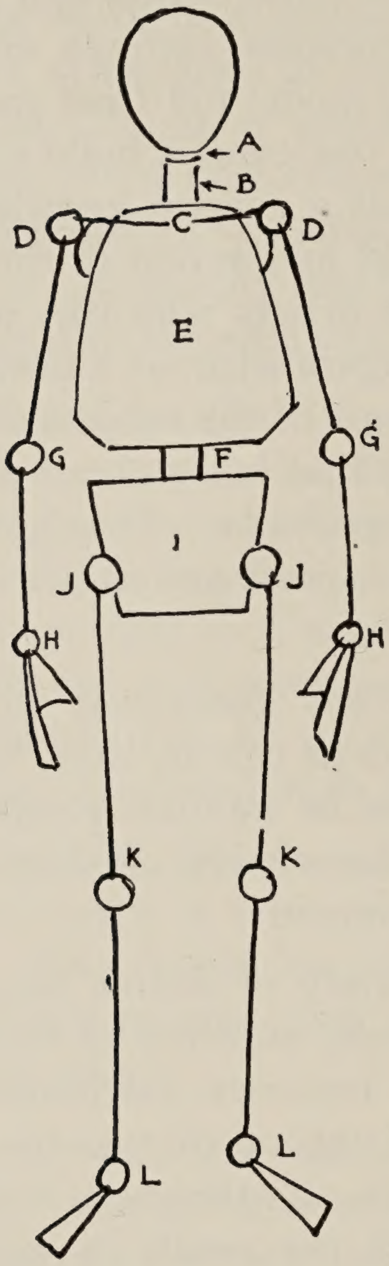


Figure 1

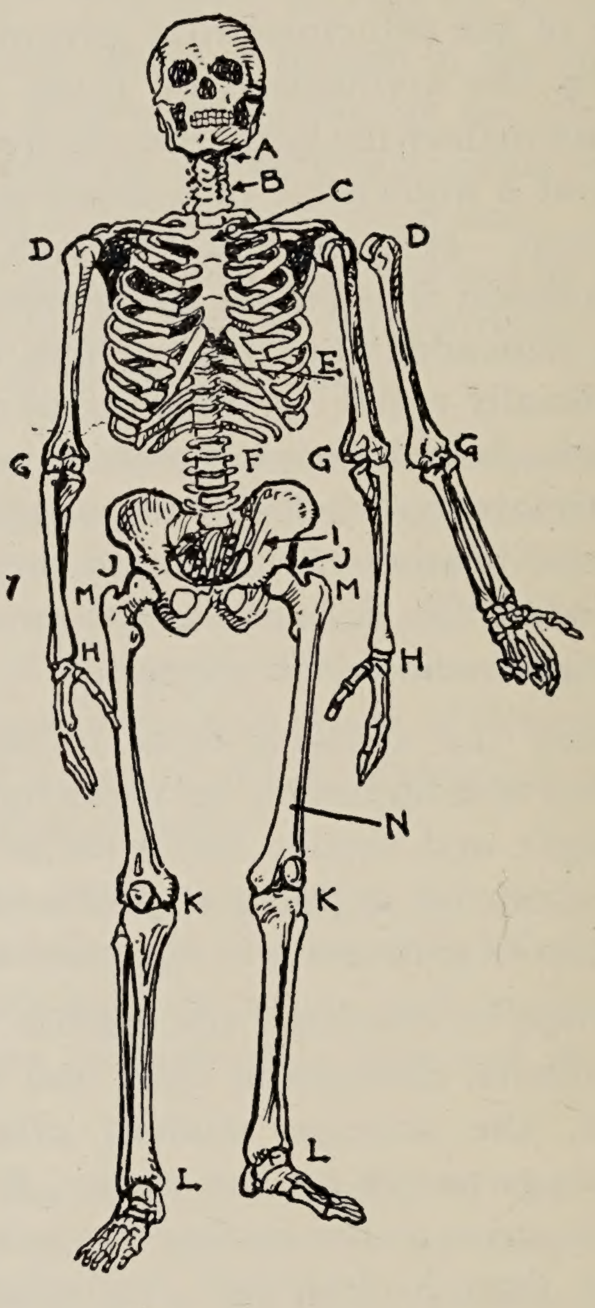


Figure 2

demic formalism is severely handicapped. Second, the student, having once become impressed by the large conception of line and construction, can then enter upon the richer stages of colour, perspective, light and shade, tone, and composition.

Figures 1 and 2 show a drawing cut of the skeleton, and a simplified figure of masses and skeleton lines based on the skeleton. This, or a similar type of figure can be used to suggest any expression of movement or action, but to use it intelligently the student should be familiar with the possibilities of movement in the different parts of the figure.

On the Figures are marked the twelve parts of the skeleton where the chief movements take place. A description of the degree to which these movements are possible is given in the text below. The student should memorize these, and prove them with the action of his own body.

POINTS OF MOVEMENT

Using these facts as a foundation, it should be possible to construct figures expressing various actions in a simplified form. The points of movement in the skeleton are as follows:

A. HEAD—This rotates on vertebrae of neck to about a right-angle to left or right, tips slightly to right and left, but more so to the front and back. These movements may be combined.

B. NECK BONES or cervical vertebrae, seven in number—These rotate or twist slightly to right and left with the movement of the head. Bend forward, backwards, and sideways with the movement of the head. This section and F are the most flexible parts of the spine, and it is at these two sections that the principal movement of the trunk takes place.

C. CLAVICLE or collar-bone, in two sections to the right and left—This bone is attached to the top of the sternum or breast-bone at the bottom front of the neck, the outer extremities resting on the projecting ends of the spines of the scapulas or shoulder blades forming the front angle of the shoulder. The collar bone and the shoulder blade work together, forming a floating or movable girdle attached only to the top of the breast-bone and open at the back between the shoulder blades. The movement of this girdle, represented by the line C in Figure 2, operates with the movements of the shoulder. These bones rotate or tip with the movement of the shoulders and arms and are even affected more or less by the action of the hips.

D. Attachment of Arm to Shoulder—This joint permits the most complete movement in the human body. The wide circles that can be described by the arm, in front and partly behind the trunk, cannot be duplicated by any other joint of the body. The ball-and-socket movement of the leg at the hips is somewhat similar, but very much more limited in range.

E. Middle of Spine or dorsal section, twelve bones in all—This section shows the least flexibility, except the extreme lower end or sacrum, which is rigid. The middle of the spine is more flexible in a woman than in a man, and especially so in bending forward. This part of the spine carries the ribs and the weight of the chest, which accounts for its comparative rigidity. It is capable of a slight rotary movement.

F. Lower Portion of Spine or lumbar vertebrae, five in number—This is the most flexible part of the spine. We notice that most of the bending of the trunk takes place at the waist, which is the region of these bones. It will be observed from the skeleton that these bones and also the cervical portion or neck, are the freest parts of the spine; that is, they are not attached to ribs, etc. They rotate to a considerable degree, and allow the body to bend in any direction, but to a much greater degree towards the front.

G. The Elbow—This has a wide range of movement, but only in the one direction. Primarily it is a one-way hinge for the raising and lowering of the forearm. However, provision is made at the elbow for the turning of the hand, though it does not necessitate a direct change of position of the elbow itself. There is a slight possibility of bending the forearm backwards at the elbow, especially in young women and children.

H. The Wrist—The hand at the wrist is capable of almost a complete rotation, mostly from the wrist itself, but felt at the elbow, the forearm being composed of two bones. In this turning process the radius bone crosses over its companion bone, the ulna, which makes possible the twisting of the hand at the wrist. This turn has an important effect on the forearm. In addition to the rotation, the flexibility of the wrist in any direction can easily be demonstrated.

I. THE PELVIC BONES—These act as a unit and include in this unit the sacrum or rigid end of the spine. They change their angle with the body as a whole, but have very few possibilities of movement in themselves.

J. THE HIP JOINT—This is the most perfect example of a ball-and-socket joint in the body. While it allows for a certain freedom of movement in every direction, it is much more restricted in range than the shoulder joint of the arm. The movement of the hip bone is chiefly forward in raising the leg or swinging the foot forward. It can, however, swing sideways or back to a limited extent.

K. THE KNEE—This is a one-way-hinge movement similar to the elbow, but the lower leg has very little of the rotating possibilities of the forearm.

L. THE ANKLE—While somewhat similar to the wrist, the ankle is much more restricted in its movement. It is at the junction of the two bones of the lower leg and those of the foot. The foot may be rotated to some extent, but this is practically all done from the leg and hips. The ankle plays a part in the tipping of the foot up or down and slightly sideways.

These are the principal points where the action of the figure originates. The different movements of which these parts are capable make up in combination the great variety of actions possible to the human figure.

The student should be his own model, and experiment, noting the possibilities and restrictions of each part of the body as referred to in these twelve points.

FIGURE IN ACTION

The four drawings shown in Figures 3 to 6 illustrate a method of laying out a figure in action. The framework is based on a skeleton form. While not correct in detail as applied to the human skeleton, it is constructed on the three main masses of the skull, the thorax or chest, and the pelvis. The spine, the shoulder girdle, and extremities are indicated by lines, and the whole

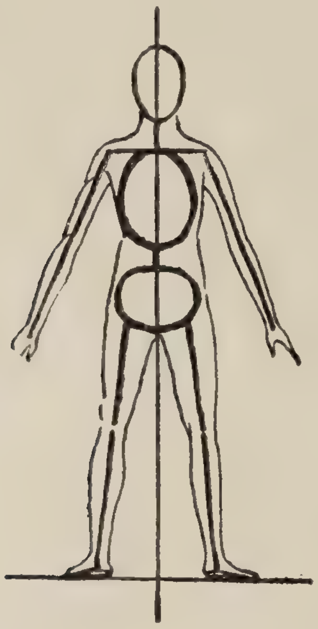


Figure 3

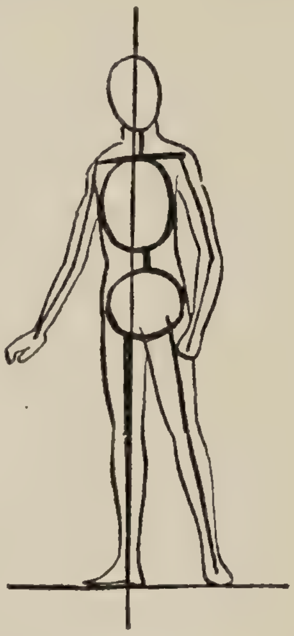


Figure 4

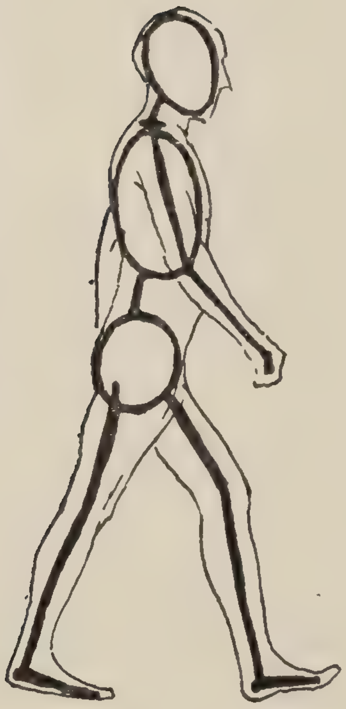


Figure 5

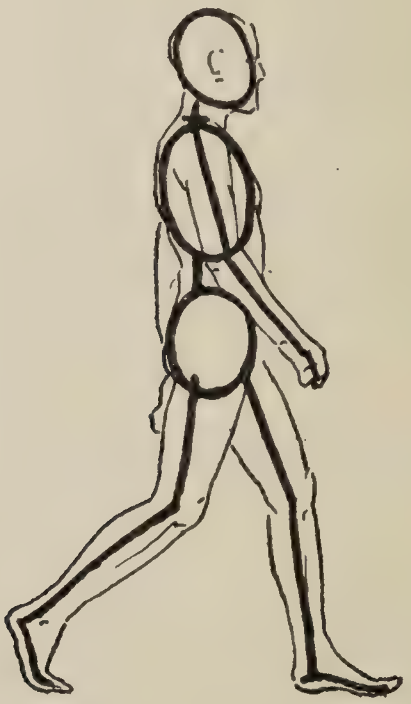


Figure 6

gives a foundation on which a figure can be built up in any action desired. This constitutes a shorthand method, as it were, of putting down an action, and should be assiduously practised. The better the knowledge of the construction of the real skeleton, the easier it will be to get the movement of the figure in this shorthand method.

The student may grow out of using this particular convention, and build up the figure in action in his own way; but this method will be found quite satisfactory where he is working without a model.

GENERAL PROPORTIONS OF THE FIGURE

There are a few fundamental proportions of the figure that it would be well to memorize. Figures 7, 8, 9, 10 illustrate these proportions in a man, a woman, and two children. The proportions of the body are usually referred to with the head as a unit of measurement. The figures used here are based on the average type. There is a considerable variation from these types in individual figures, and the standard measurements given should not be considered unchangeable. Also, it should be always borne in mind that any variation from this straight perpendicular pose may cause foreshortening and a consequent change in the appearance of the proportions.

The standard adult figure measures from seven and a half to eight heads in height, as shown in Figures 8 and 10. Also note that the length of the extended arms from the tips of the fingers should correspond, or nearly so, with the height of the figure. (See Figure 8.) The female figure is generally somewhat shorter than the male, but the measurement by heads is about equivalent.

Note that the perpendicular centre of the figure in adults falls away slightly above the crotch, as marked by the cross in Figures 8 and 10.

In infants at birth the head measures about one-fourth of the height of the figure, the increase in growth of the rest of the figure for the first five or six years being at a greater ratio than that of the head. At six years the proportion is six heads to the height of the figure. (See Figure 7.) At nine years, (Figure 9), the average proportion has reached six and a half heads, and at maturity, as already stated, seven and a half to eight heads is arrived at.

In the height of the infant, the head being large in proportion, the legs are correspondingly short. This brings the perpendicular centre at a higher point than in the adult. It gradually changes to normal with the growth to maturity.

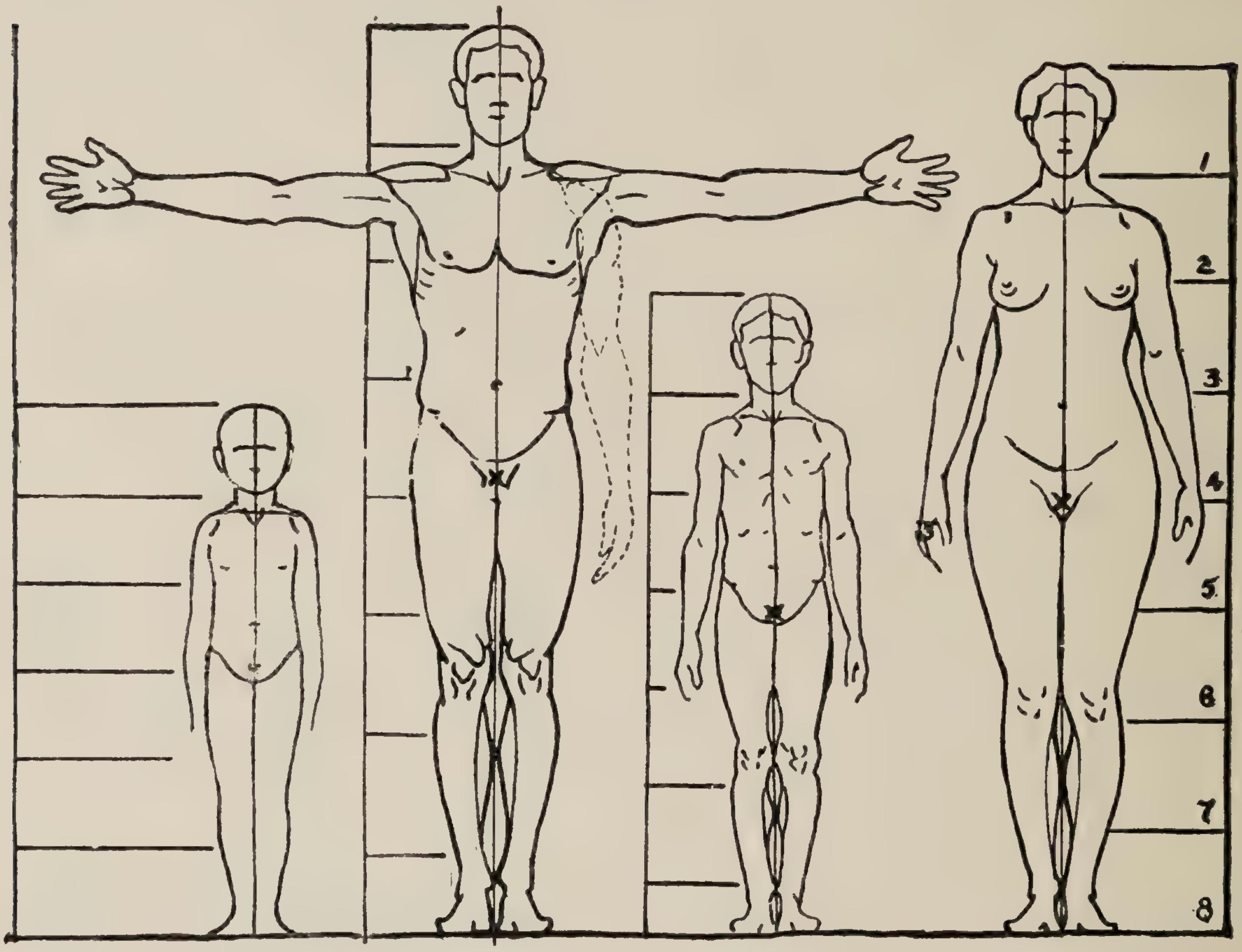


Figure 7 Figure 8 Figure 9 Figure 10

In adult figures, measuring by heads from the top of the head, the divisions fall, as illustrated in Figures 8 and 10—1, chin; 2, nipples at breasts; 3, the navel; 4, at the crotch; 5 and 6, at points on the thigh and lower leg—the top of the knee falling half-way between 5 and 6. Point 7, above the ankle, the lower measurement being one-half of a whole head, reaching the heel.

Another measurement to note is that the trunk can be divided generally into three measurements—from the top of the head to the shoulders or the collar bone, from the shoulders to the waist, and from the waist to the crotch, which is slightly below half of the total height of the figure. The lower limbs can be divided into two parts, that is, from the crotch or from the head of the fibular or thigh bone to the bottom of the patella or kneecap, and the lower half, to the heel.

It is well to remember in these measurements a few variations between the male and the female figure. The thorax or chest cavity, being larger in the male than in the female, will make the male waist line slightly lower. This applies to the back and the front view. Correspondingly, the lower third of the trunk in the female is slightly the largest division.

The male arms and legs are longer in proportion than those of the female. Carefully note in Figures 8 and 10 the position of the finger tips in relation to the thigh in the hanging arms of both figures. The female arms being shorter than the male, the fingers do not reach a point so low.

The most apparent difference between the male and the female figures is the difference of width of the shoulders and the hips. The male has broad shoulders and narrow hips, while the female proportions are reversed—wide at the hips and comparatively narrow shoulders. The male limbs are longer than the female limbs, and the hands and the feet are larger.

Owing to the greater width of the female pelvic bones, the larger bones of the upper leg converge to a greater degree, causing a slight tendency to "knock-knee," which is noticeable in women. (See Figure 10.) The female calves are more pronounced, the ankles and the wrists are more slender, and the instep more convex than in the case of the male.

Another point of difference may be noted. In the skull of the female the occipital or frontal bones are smaller in proportion than those of the male, giving the effect of smaller features. After all, rules of proportion have their limitations, as no two people are exactly alike in proportion; and change of position or action may upset any hard and fast scale. The artist must train his eye to know good proportion when he sees it. The student should make studies of the separate parts and limbs of the body, noting their proportions and constructions.

BALANCE OF STANDING FIGURES

In constructing a figure by the simple method referred to, the matter of balance should be considered. A plumb line, or vertical centre line drawn through the figure, is the basis by which the balance should be arrived at. In the standing figure, front view, when the weight is equally distributed on both feet the plumb line will pass through the centre of the neck, reaching the ground at an equal distance between the feet. (See Figure 3.) This applies whether the feet are together or apart.

When the weight is thrown on one foot, the balance shifts to that side, and the vertical plumb line of balance will fall from the centre of the neck through the ankle of the foot supporting the weight. (See Figure 4.) The balance of the standing figure shifts between these two extremes according to the amount of weight supported by each foot. In constructing a standing figure this principle of balance should always be verified.

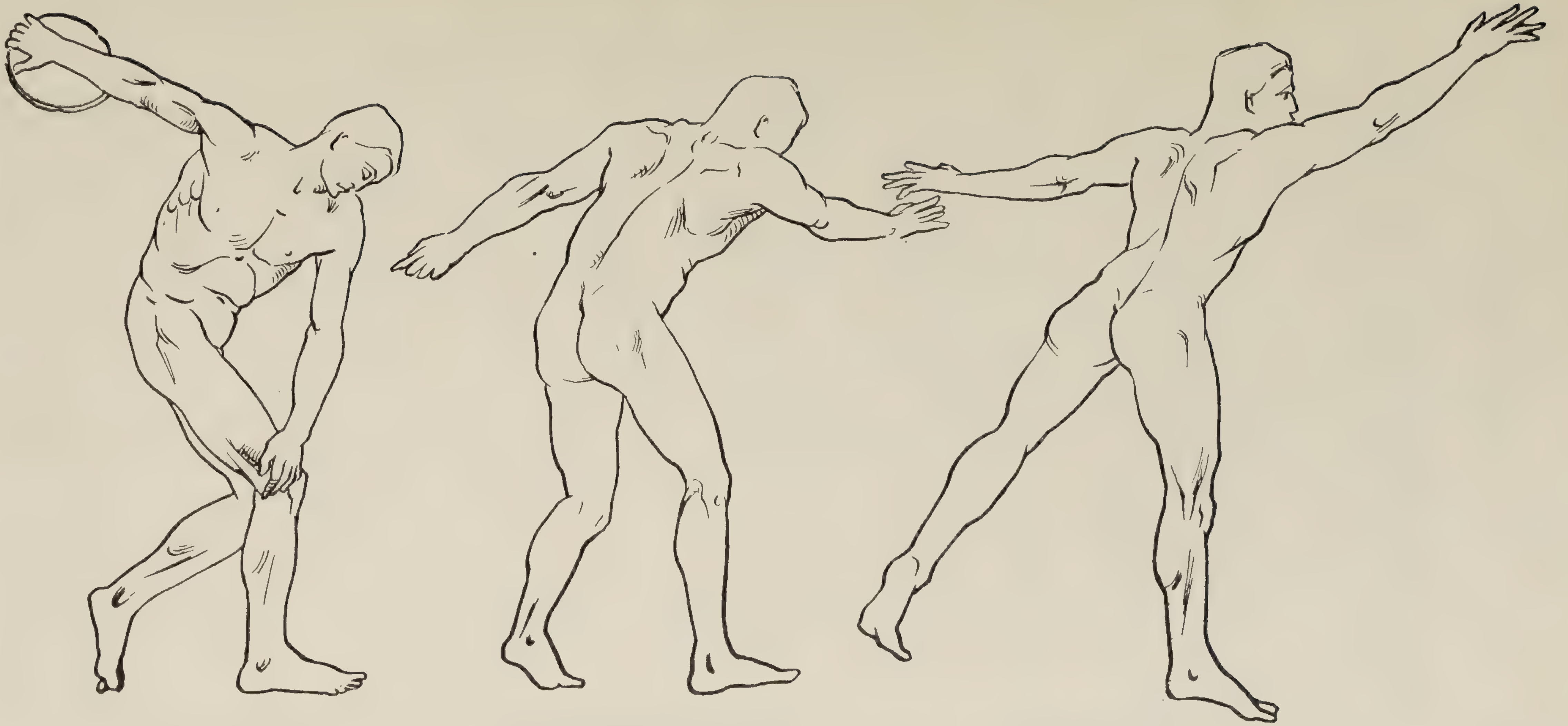
When the figure is in action, this principle of balance does not apply, and a hard and fast rule cannot be laid down. Figures 5 and 6 suggest walking in its various phases.

ACTION

It is not sufficient to know the effect upon the figure when seen in the standing positions shown in Figures 3 and 4, but the chief vital test comes in the representation of more varied actions.

Action may be divided into three classes: Still action, final action, and intermediate action.

Still Action.—This takes place when, during the performance of a sequence of movements, a short immobility compatible



First Movement Intermediate Movement Final Movement

Figure 11

with the whole performance sets in. Examples: A general instructing his officers during a battle and pointing in a certain direction, a man contemplating an object, a person reading a book.

Final Action.—This is the last stage of some performance involving the expenditure of skill, passion, grace, etc., such as the pose immediately after throwing a ball, the attitude of the boxer after having given a knockout blow, or that of the dancer after her last pirouette.

Intermediate Action.—This represents a number of actions of a momentary character taking place in a short space of time. Such actions may be slow or quick, regular or irregular. Examples: Serving in tennis, running, a man sawing wood, a man throwing the discus are examples. (See Figure 11.)

This last phase of action is perhaps the most difficult to represent, requiring quickness of observation and a readiness to express essentials within a limited time. It is the capacity to visualize and memorize essentials in action that alone will make the difference between a copyist and a creator. (Compare page 6.) It was the extraordinary grasp of this idea that brought into being the great series of athletic sculptures by the ancient Greeks, such as Myron's Discus Thrower, the Gladiator of Lysippus, and the great battle scene created by Leonardo da Vinci many centuries later. The violent action of horses and men prove what a rich store of knowledge Leonardo possessed.

Not only does this principle apply to the figure as a whole, but also to certain details. The average student after a certain amount of training may find little difficulty in drawing a head in still action, but the changing expression, as in the case of passion, anger, joy, or sorrow, presents a different problem, and one which demands the keenest perception.

The hands that we find in many of the works of the early Italian masters are eloquent of certain modes of expression chiefly because of their action; so that power, grace, tenderness, and many other attributes, are clearly seen in these works. It is evident that certain movements of the body accompany certain emotions. The draughtsman must be careful that the expression throughout the body is consistent; that he does not limit such to the features only.

THE HEAD

Figures 12 to 16 are drawn to illustrate a simplified construction of the head based on an egg shape. Figure 12 shows a straight-on view, the centre line passing through the eyes to the top of the ears. This line is generally accepted as the correct vertical centre of the normal head, placed vertically on a level with the eye. The lower half of the face divides again at the tip of the nose, which line is on a level with the lobe or lower tip of the ear. The centre line of the

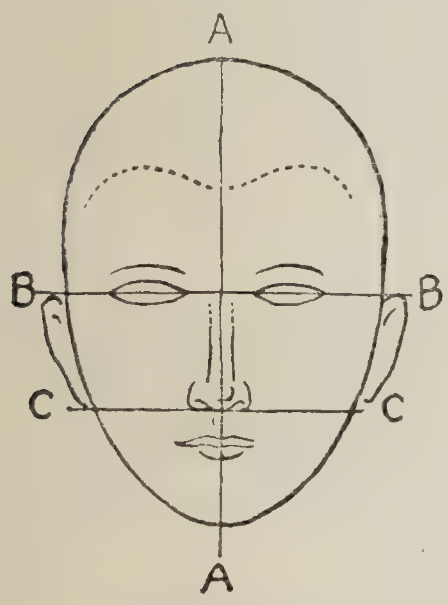


Figure 12

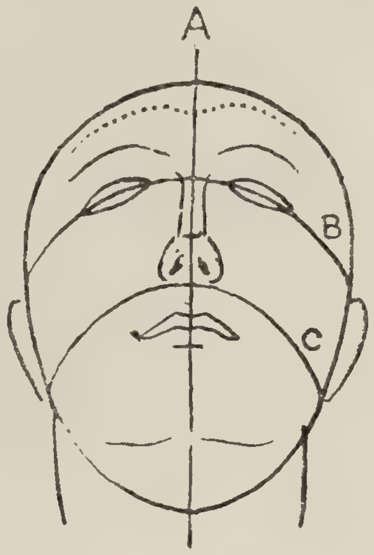


Figure 13

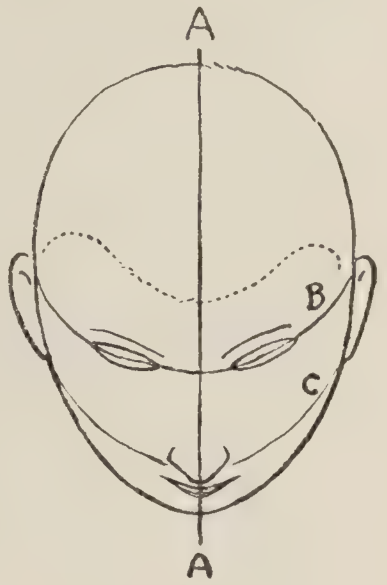


Figure 14

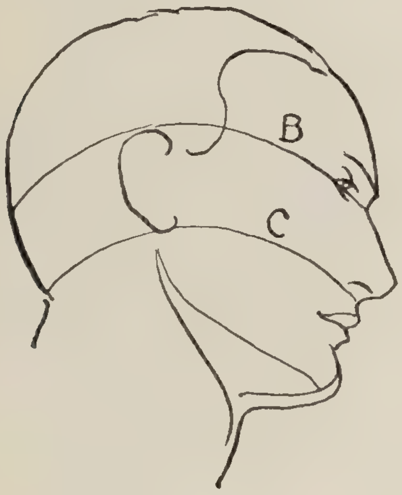


Figure 15

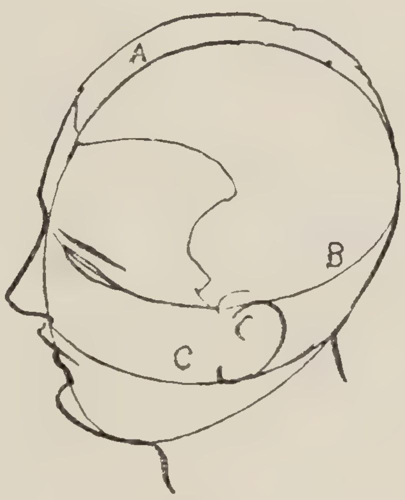


Figure 16

mouth is placed about quarter distance from the tip of the nose to the chin.

Of course these measurements are subject to slight changes in different types of features and in different races, but they are generally accepted as normal standards.

The three construction lines shown in Figures 12 to 16 form a sure basis for the construction of the features with the head in various positions. Note how, with the head tilted upward or downward, the line follows the contour of the oval and expresses the foreshortening which takes place. In Figures 15 and 16, where the head is tilted slightly to the side as well, the same rule holds good.

Note in Figure 16 how the vertical centre likewise follows the contour, passing from the chin through the forehead between the eyes and over the dome of the head. This same line must also pass through the centre of the base of the nose and the centre of the mouth and the chin.

With the head in profile, based on the egg shape, the nose is a projection from the oval. Also the chin and the lips may project slightly. Note carefully how the ears are placed in position relative to the eyes and the nose. Observe that their placing is affected by the tilting of the head. The same line which passes through the centre of the eyes to the top of the ear in Figure 12 follows the contour of the head when tilted as in Figures 13 to 16, and passes through the same points. If the student understands these principles, he should with very little difficulty be able to sketch the head in any position.

The three imaginary construction lines shown in these illustrations are the basis for placing the eyes, nose, ears, etc., and the first procedure in laying out a head is the correct placing of these three lines. The experienced draughtsman may not actually draw in these lines, but his drawing must, nevertheless, be based on the same principles of construction.

When the head is thrown back as in Figure 13, and in the drawing of the skull tilted back (Figure 17), the foreshortening of the nose causes the nostrils to come into more prominence, and the distance between the eye and the nose apparently decreases owing to the foreshortening. The chin comes into prominence, and the forehead recedes. When the head is tipped downward, as in Figure 14 above, the reverse takes place. The top of the head is prominent, and the chin recedes.

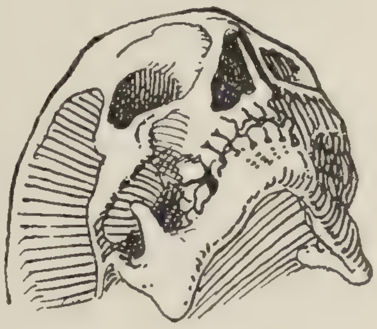


Figure 17

Bony Structure

The Skull.—The skull is made up of a number of bones, but the parts of the top or cranium are so closely articulated that for all practical purposes it is considered as one bone. In the infant the articulation is not so close, and there is a certain amount of flexibility. As the child grows the flexibility lessens.

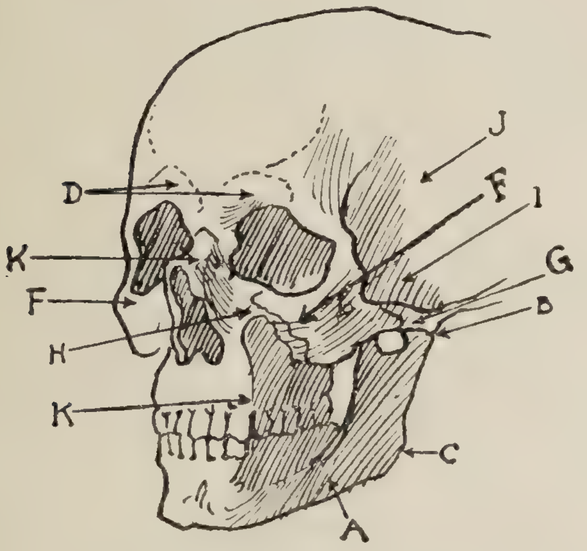


Figure 18

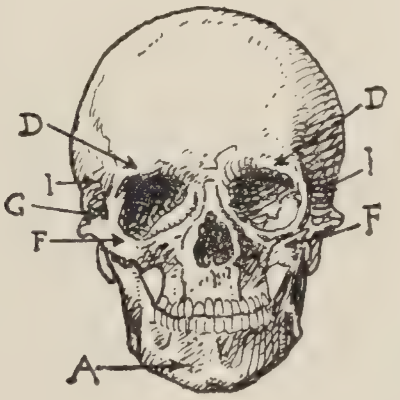


Figure 19

The lower jaw or mandible (Figures 17, 18, 19) is a separate bone which supports the lower teeth and articulates or hinges with the cranium at a point directly below the junction of the cheek bone and the ear cavity. (See Figures 17, 18). This bone is strongly arched and projects forward at the bottom front, forming the base for the chin. The bottom line of this big bone should be carefully studied, as it has a marked effect on the character of the head. Note especially the lower angle of the jaw where the bone turns upward towards the ear.

The lower jaw bone is massively built, with flat planes upon which are attached flat bands of muscle controlling the opening of the mouth. There is a great variety in the angle and character of individual jaw bones, changing with types and nationalities. The angle of the jaw in women is much less pronounced than it is in men, which causes more of an oval face and less of a square-jawed effect.

The principal points of interest in the cranium or upper part of the skull are the arching of the brow or frontal bone over the eye sockets D, and the slight protuberance of the lower frontal bone between the eyes over the nose. The extent of this protuberance varies greatly. It can be noticed in the profile skull, Figure 20 E, and also in the strongly marked flat ridge which marks the cheek bones F.

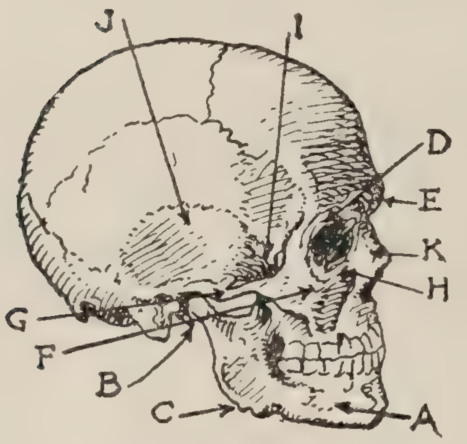
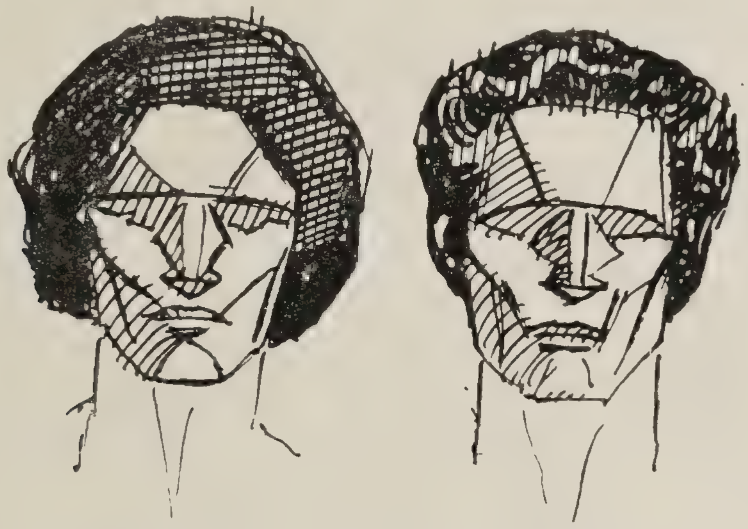


Figure 20

Cheek Bone.—This bone is nearly as strongly marked and is one of the important points in the construction of the face. Its form may be studied in Figures 18, 19, 20 F, above. Its upper ridge forms the lower edge of the eye socket, and it swings up around the outer edge of the eye socket to meet the brow, making another important ridge.

Notice that the bone extends into a narrow arch towards the ear G, and at B it is articulated with the lower jaw. Also note in the front view, Figure 19, how the widest part of the skull usually is just above the ears. The surface of the cheek bone is quite flat and forms a definite angle of the face. It is practically surrounded by depressions, which of course become more noticeable as the face becomes emaciated. The most obvious of these depressions is the line on the side plane of the face extending towards the ear, marking the line of the under side of the cheek bone. This is a definite line of construction in the average head and especially so in the aged person. It also extends around the front of the face under the eye to the nose H. Another depression is seen above the arch and behind the eyes I. This is a shallower depression, but marks the boundary of the large flat plane at the head J.

There is quite a feeling of angularity in the teeth and jaws; the slight angles being formed by the eye teeth, which correspond to the prominent fangs in the skull of the dog or of carnivorous animals.



PLANES OF THE HEAD

Figure 21 Figure 22

In the heads of the lower animals there are certain structural characteristics that are found also in the human head. The great difference is not in kind but in degree. There are two radical structural differences to be mentioned: First the relative position and the proportion of the lower to the upper part of the skull, and second, the relative position of the head to the body. The head of the animal is carried in a nearly horizontal position, whereas man carries it in a vertical position. Indeed, man alone stands erect.

A proper understanding of the solid form of the head by a series of planes is desirable. The method of working by planes is seen in Figures 21 and 22. The lines are drawn with uncompromising straightness, as it is well first to secure the direction in which the ridges dividing the planes are lying. Any tendency to round off forms in the early stages of drawing a head would be undesirable, as this leads to devoting too much time to the less important details. There can be no doubt that the form in its essence is seen in the rather rough-hewn condition which almost straight lines devoid of a softness which is too often paltry, produce.

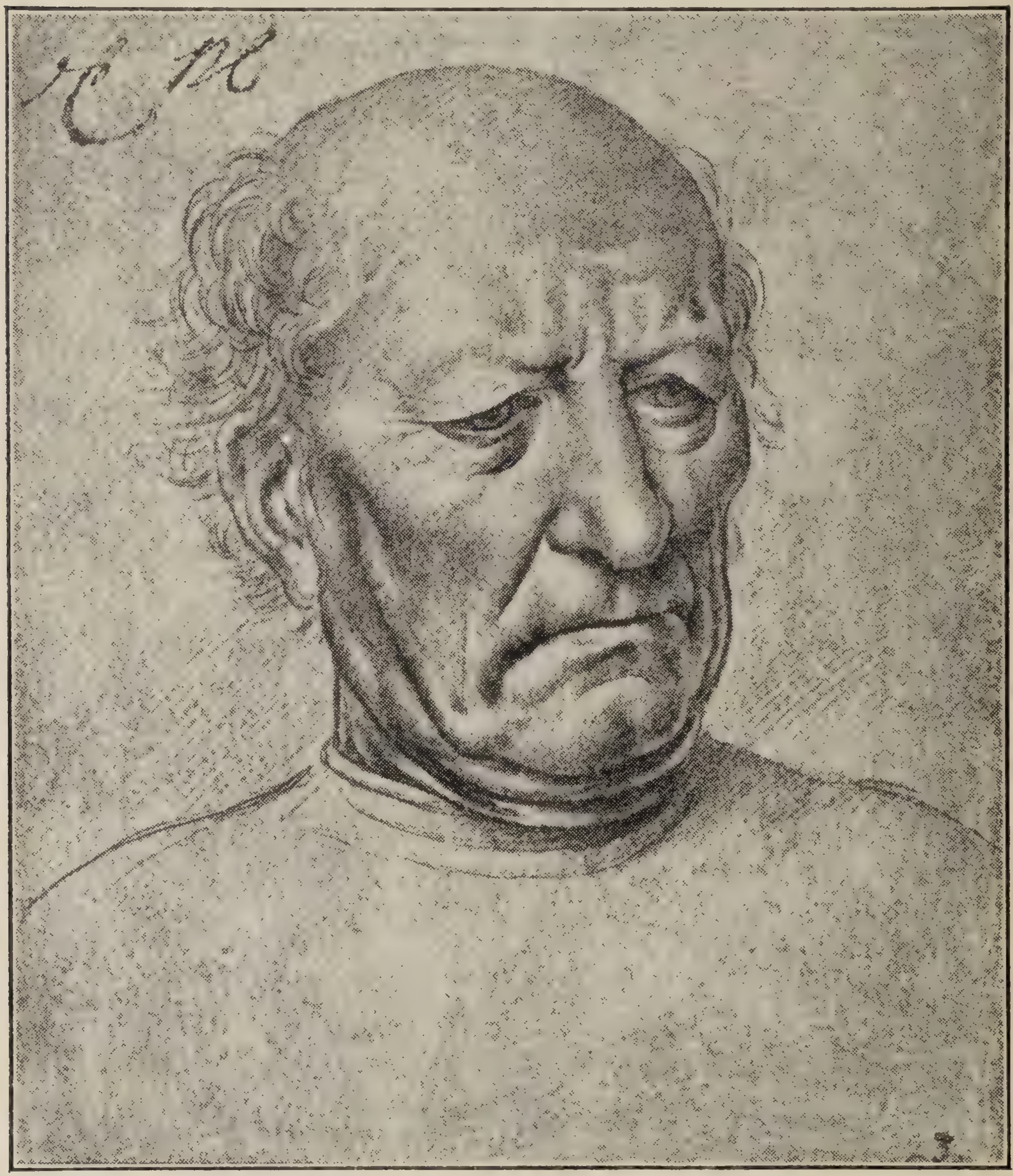


Figure 23 *Da Vinci*

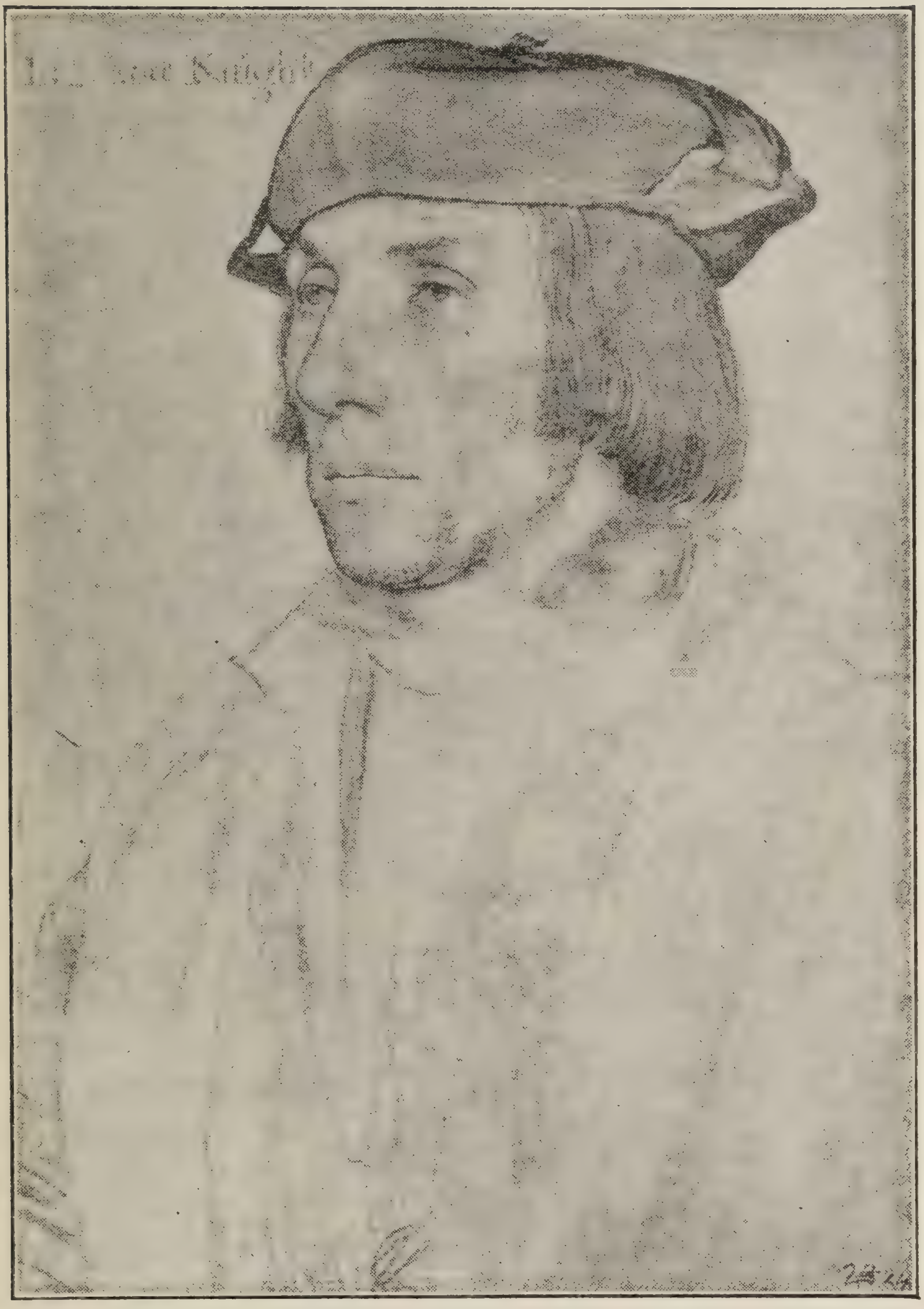


Figure 24 —*Holbein*

This part of the study should be considered in relation to the skull and the muscles of the head and neck. The understanding of the planes will enable the student to grasp more readily the three essentials that characterize a strong drawing: First, the carriage of the head or its action; second, its construction; third, the character and personality of the sitter.

It is interesting to note how these factors have been vitally expressed in the drawings by the great masters. Figure 23 shows a reproduction from a drawing by Leonardo da Vinci. This work belongs to the early part of the sixteenth century. It shows great vitality and strength, not only in its construction but in the individual modelling. The bony structure has been maintained, and this contrasts with the fleshy parts. The head is drawn with extreme sensitiveness and yet with power.

Figure 24 shows a reproduction from one of the many fine drawings by Holbein. It possesses great charm and will always serve as a standard of modelling and construction. Holbein was a singular, vivid, original genius, possessing the faculty for seizing the essential quality of human expression.

Muscles of the Head

After a thorough study of the bony structure of the head, a knowledge of the principal muscles and their function is necessary, but only so far as they influence the outer surface of the form. Many muscles are not visible on the surface and do not affect it in any noticeable degree.

We will first mention three circular muscles which encircle the eyes and the mouth and which close their openings. (See Figure 25.) Those of the eyes are marked A, while those of the mouth are marked B. These muscles around the mouth are connected with a great many of the muscles of the face, but those of the eye have only a few other muscles which are closely associated. They are the muscles over the nose C, and D—a large band of muscle running up above the eyes. These two muscles both act in wrinkling the forehead, and the one C alone, in wrinkling the nose.

The muscles of the cheek and chin operate the mouth upward, downward, or backward. They have one end attached to the bone, while the end which is near the mouth is attached to the muscle B.

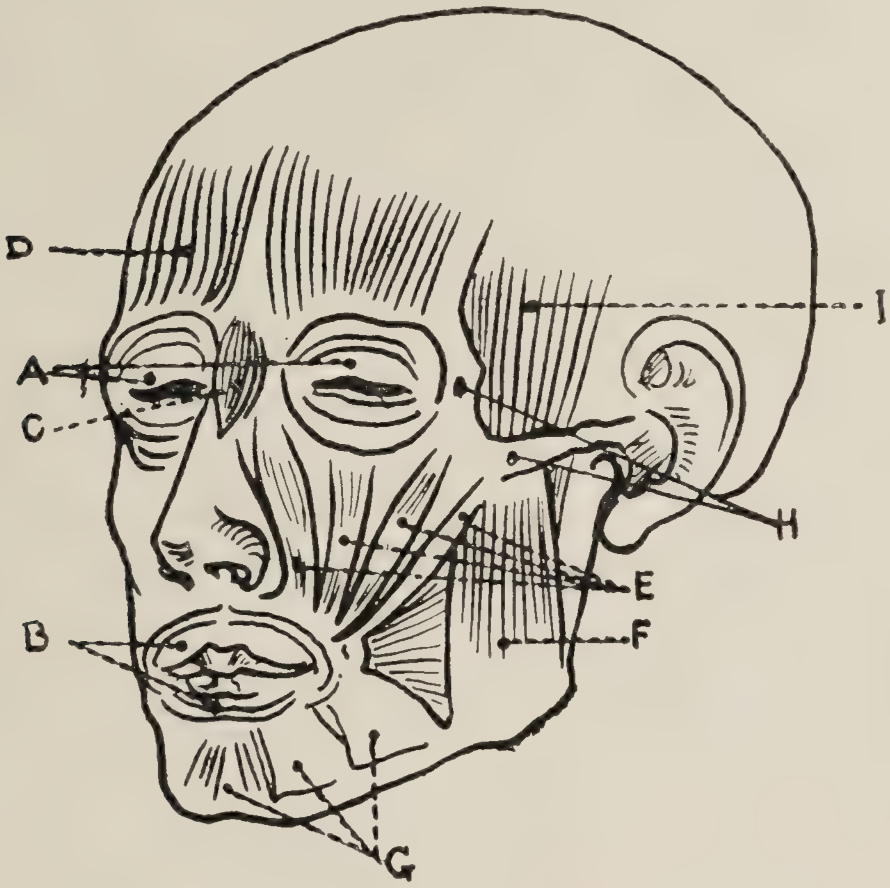


Figure 25

Attached to this circular band of muscles around the mouth on either side of the upper cheek will be found four muscles which arise from the cheek bone.

These muscles are narrow flat bands which serve the purpose of elevating the mouth, and the innermost one the nostrils. They play a big part in the facial expressions such as the smile. The most noticeable of this group is the outer one, which forms the border between the frontal plane and the side plane of the cheek.

Next in importance is the great muscle by which the lower jaw is drawn up as in chewing. Note that this muscle has a slightly backward slant from the cheek bone where it arises to the angle of the jaw. Thus it does not follow the line of the jaw bone, which has a forward slant.

In opposition to these muscles above the mouth are a set of muscles below the mouth G. Of these the two outside lower the mouth, and the centre one elevates the chin.

Muscles of the Neck

The two principal muscles affecting the neck are the sterno-mastoid muscle A and the trapezius E. (See Figure 26.)

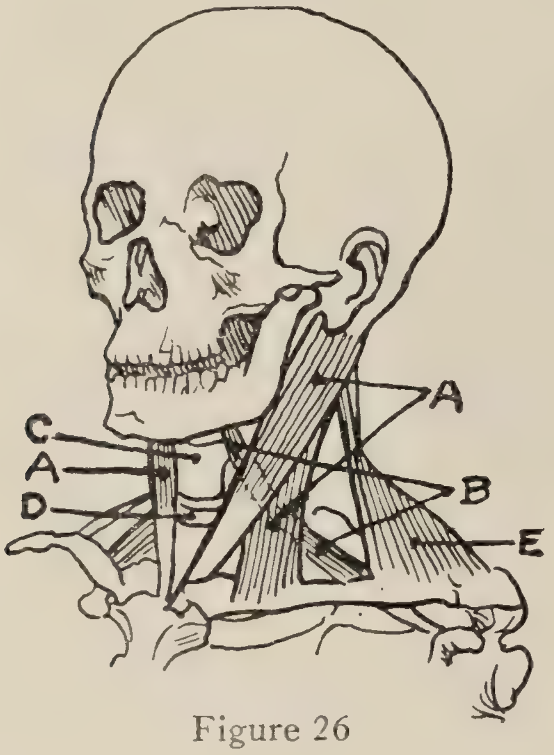


Figure 26

The sterno-mastoid is the most marked muscular feature of the neck, and forms an oblique ridge on either side; it is thick and strong, being very pronounced when the head is turned sideways. It is attached to the skull behind the ear and to the inner portion of the collar bone.

The trapezius has the most extensive attachment of any muscle of the body. It is attached to the skull, shoulder blade, collarbone, and vertebrae. The shape and bulk of the trapezius can best be seen when the shoulders are drawn back. From the front view the space between the sterno-mastoid and the trapezius forms a triangular depression.

The front of the neck between the mastoid muscles makes a triangular shape with the apex turned downward. Within this space we find the Adam's Apple C, which has a prominent projection.

Above and below the Adam's Apple are cartilages B and (D), all combining to give the effect of fulness to the profile view of the neck.

The neck is built in a cylindrical shape more perfect in women than in men. Owing to the prominence of the muscular forms in man, the neck is less of a cylinder.

DETAILS OF THE HEAD

THE EYE.—The bony sockets of the skull which contain the eye are divided by a bony bridge shaped like the keystone of an arch, out of which and directly below projects the nasal bone or bridge of the nose. The upper line of the eye sockets takes a somewhat undulating curve slightly downward in direction and with a backward swing. This downward angle is counteracted by the slope of the eyebrows, as they rise to a point well above the bony socket. Thus it will be seen that the opening of the eye is at a straighter angle than the bony socket which contains it. The shape of the eye socket is somewhat rectangular, and its general plane is downward and backward.

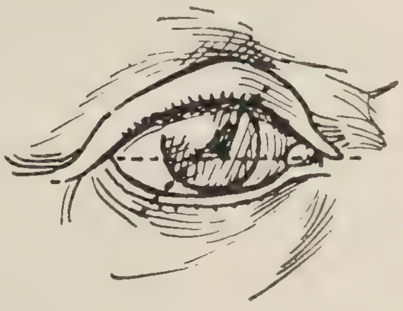


Figure 27

The downward slant of the socket is distinctly seen in the direction of the pouch which forms under the eyes in elderly people, also in the direction of the fold of the upper lid as it slants downward and backward towards the outside corner.

The opening of the eye is not a symmetrical shape. The highest point on the upper margin occurs on the inside end, the same place as the thickest part of the upper lid. The lowest point on the under side is towards the outside. (See Figure 27.)

The rolling of the eyeball changes the shape of the opening, principally on the upper lid. The reason for this is that the iris or colour part of the eye is slightly raised from the surface of the eyeball itself. Thus wherever the iris is turned, it lifts and spreads the upper lid slightly. (See Figure 28.)

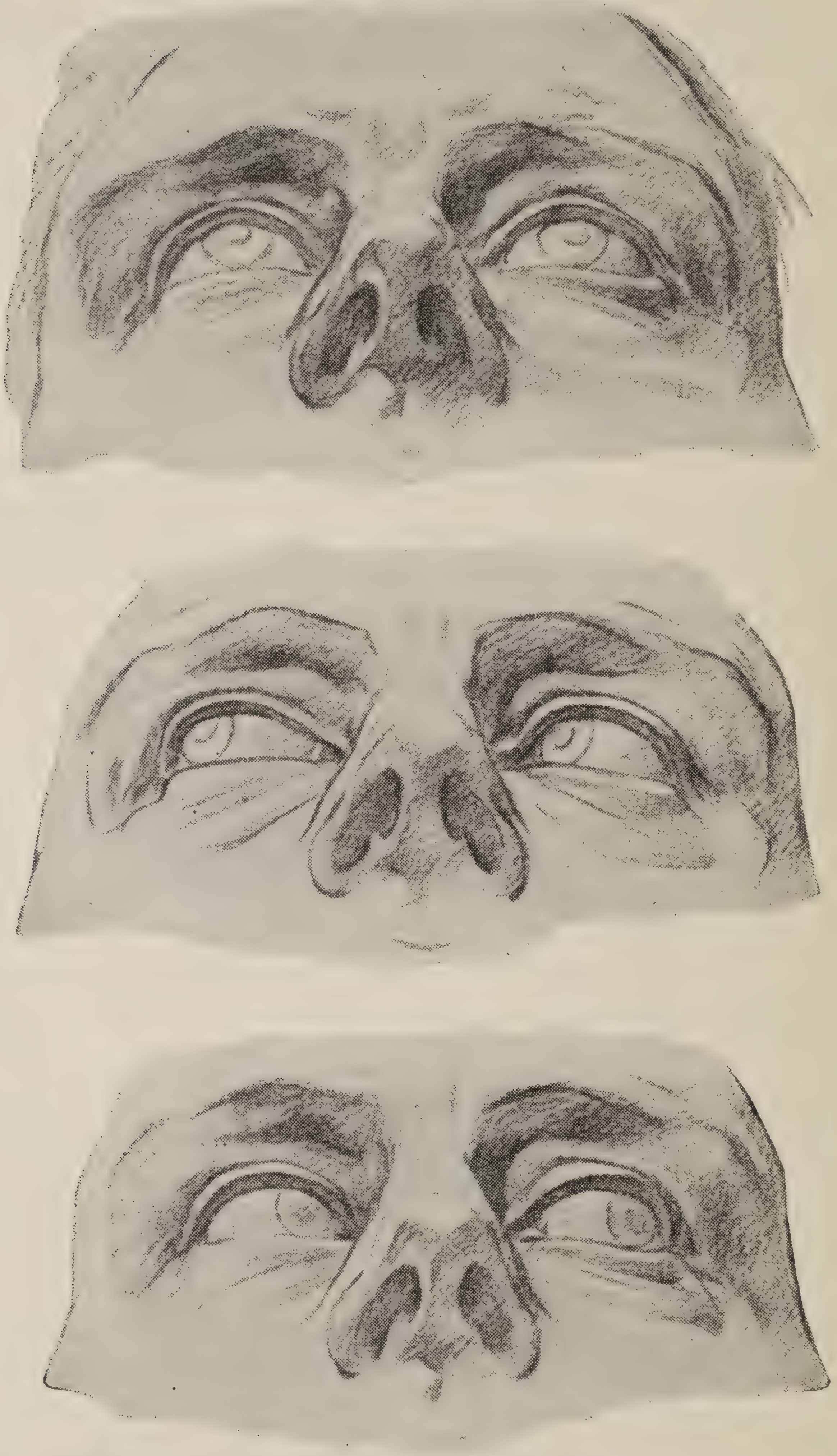


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Figure 28

In the three-quarter view of the eye (Figure 29), the shape of the iris becomes oval instead of round, and the pupil does not fall exactly in the centre, as it is set back in the iris, which is transparent.

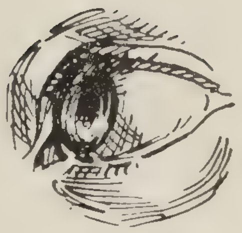

Figure 29

THE NOSE.—Directly below the keystone formation between the two eyebrows the nose projects with its four great planes—the front or top, the two sides slanting slightly outward from the front, and the bottom plane in which are found the nostrils. The nasal bone extends less than one-half the distance from the eyebrows, the lower half of the nose being composed of cartilage.

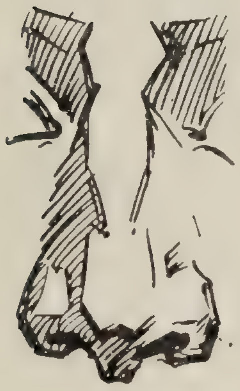

Figure 30

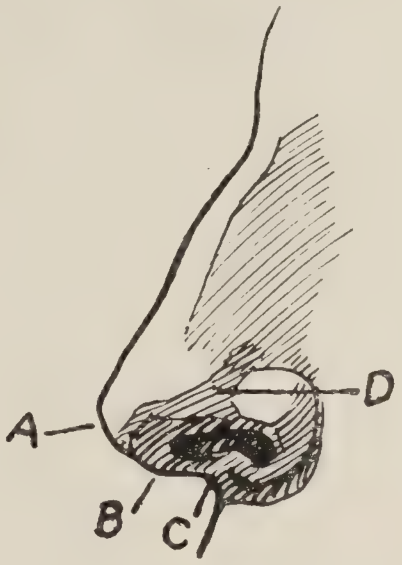

Figure 31

The top plane of the nose originates at the base of the keystone between the eyebrows. It is slightly rounded, with a more definite roundness at the bridge. The bridge is often raised, depending on the type of nose. Downward from the bridge the front plane narrows, until it merges like a wedge into the broader formation of the bulbous end of the nose. (See Figure 30.)

Leaving the front plane the cartilaginous surface takes a sudden short turn downward and inward, forming the upper and flatter angle of the end. (See Figure 31 A.) Leaving this angle it narrows and swings in a slight curve to the upper lip, to which it is joined between the two nostrils. The lowest projection of the nose is on the outside of this curve B.

On either side of the central ridge of the under side of the nose are the two wings in which are the nostrils. These wings expand or spread towards the cheek in a buttress-like formation.

In a profile view of the nose, the junction of the upper lip with the under side of the nose occurs at a point about one-half the distance from the tip of the nose to the innermost edge of the wings. (See Figure 31, C.)

THE MOUTH AND CHIN.—The mouth and chin are both projections from the general mass of the face. The mouth is highly convex in its general curve around the face, the projection of the lips making it more convex than the general plane of the face. It is the most mobile part of the face and subject to a greater variety of expression. The muscular attachments allow the lips to be projected forward, to spread apart, to contract, and also to expand with the opening of the jaw.

The planes of the upper and lower lips seem to alternate in character to a great extent. The upper lip has two big planes falling away from the central projection. The lower lip has three planes. The planes of the upper lip are quite flat and angular in character and somewhat thinned, while those of the lower lip are fuller and more rounded. Figure 32 will show how in the centre of the mouth on the upper lip is a concavity in line with a corresponding dip below it. This projection fits into a slight depression in the centre of the lower lip, causing a concave line in that lip. Immediately under this will be found a reverse convex line marking the centre border of the lower lip.

In a well-formed mouth the upper lip should project well over the lower, as seen in the profile view in Figure 33. The upper lip has a more definite outline, and especially so near the outer corners. The lower lip, owing to its rounded character, is quite soft at the edges and has the most definite edge at the front plane.

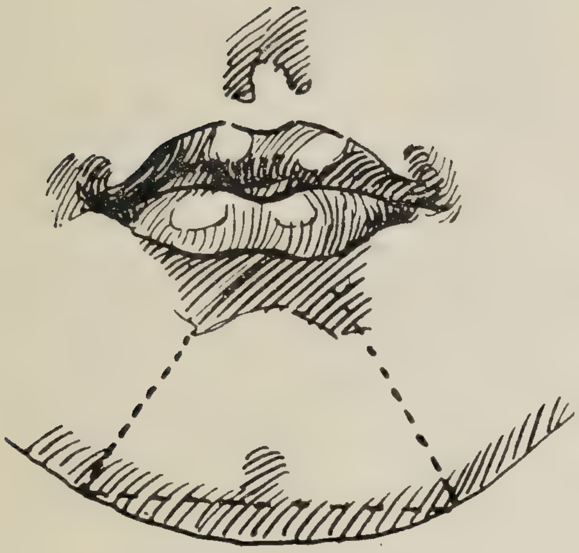

Figure 32

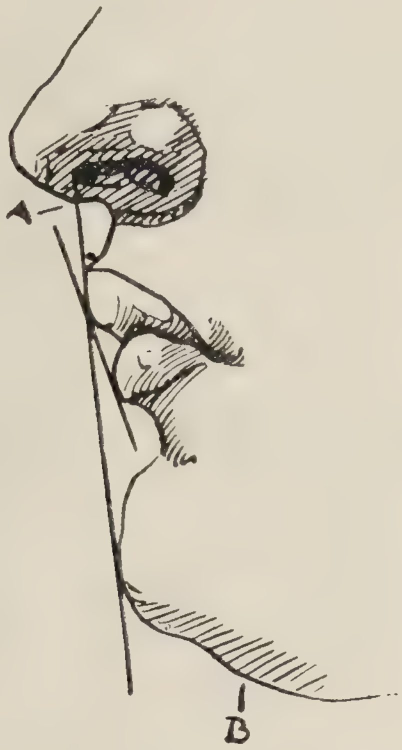

Figure 33

The chin is supported by the projecting bone of the lower jaw, and is separated from the mouth by a distinct depression below the lower lip. The character of this depression and of the chin below it is so varied with the individual that the types must be studied separately.

Character, Action, and Facial Expression

After the details of the human figure have been studied, the expression of character and emotion leads to a deeper and more subtle observation. In a general way the character of an individual or type is indicated by the form of the skull and the features. The general proportions of the figure may also have an important bearing on the type.

Racial characteristics play a large part in the determination of types. The high cheek bones so typical of the Mongolian and Slav races, and the thick lips, bullet-shaped head, and flat nostrils of the negro races, with corresponding differences of complexion and colour, are examples of what we mean.

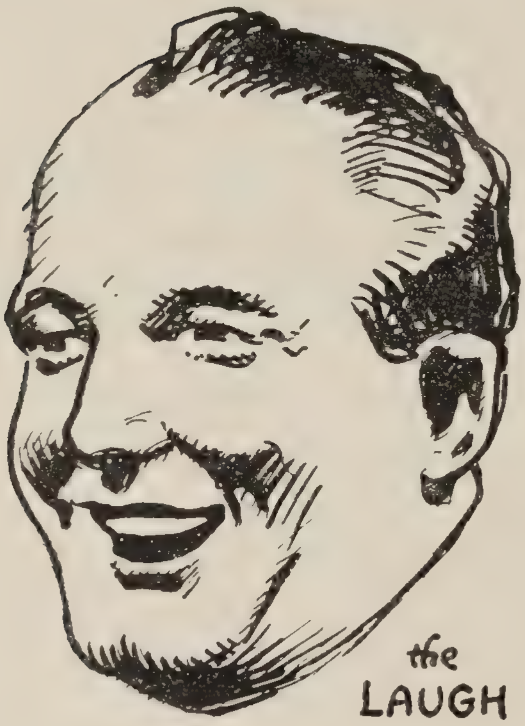

Figure 34

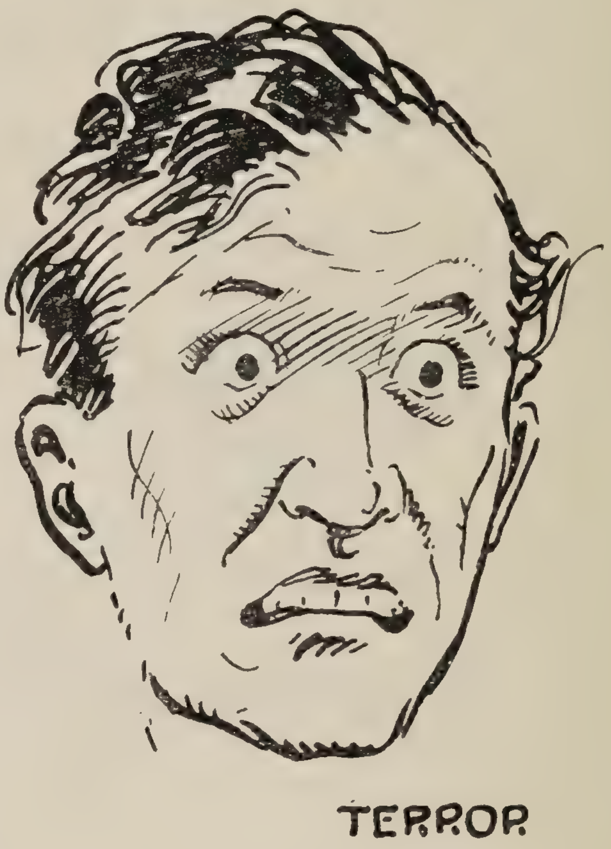

Figure 35

Facial expression can be divided generally into three classifications—pleasure, repose, and pain. Under pleasure will be found all those emotions which tend toward happiness, while pain includes the violent emotions which cause a distressing disturbance of body or mind. In a general way, pleasure causes an upward tendency in the lines of the face. In repose they are normal, while in pain the tendency is downward.

Laughter.—The same muscular action is seen as in the smile, but more emphasized. The eyes may become almost entirely closed, with increased wrinkles at the corners. (See Figure 34).

Meditation.—The head is usually bent down, the eyes look downward or forward, but not sideways. If the eyes look sideways, it suggests searching for an idea. Eyebrows brought together cause a lowering effect, with deep furrows between the brows radiating outward. The mouth closed and tense with a slight droop indicates thoughtfulness.

Terror.—Figure 35 exhibits wildly dilated eyes showing whites all around, the eyebrows and forehead violently raised, the nostrils dilated, the mouth open, the lower jaw dropped, the corners of the mouth drawn down, and the disordered hair, all suggestive of terror.

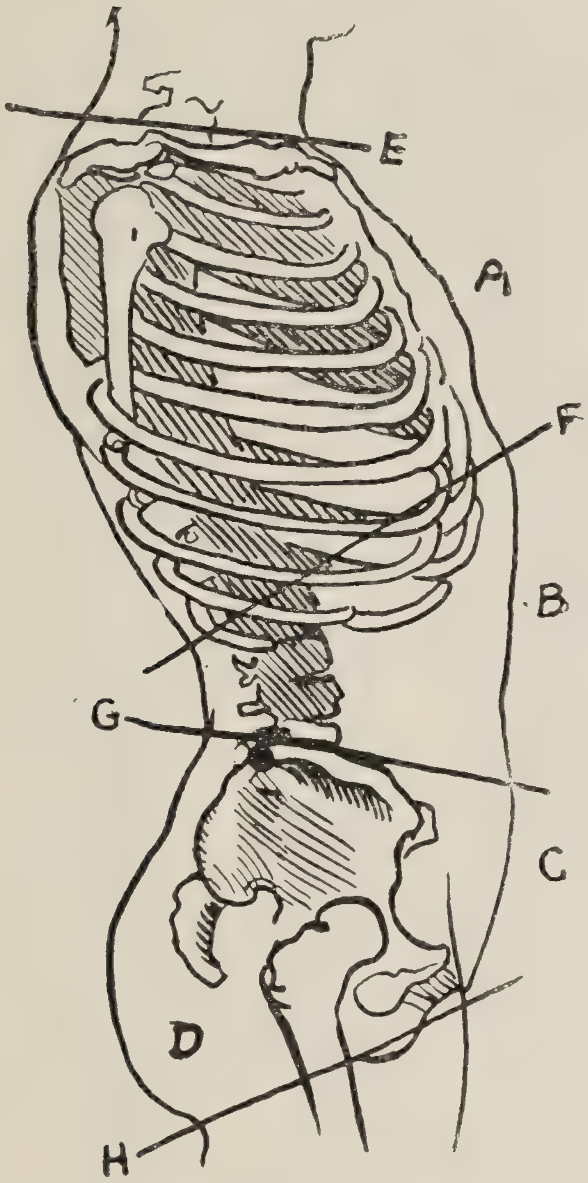

Figure 36

THE TRUNK

The trunk as a whole is divided into three main sections, the largest being the bony cage called the thorax, which incloses the vital organs. The front plane of the thorax is commonly called the chest. The middle portion of the trunk is fleshy in character, the only bony structure being the lumbar vertebrae. Below this is the third or pelvic section, also bony in character, but more heavily covered by large muscles, and this bony structure is built to support the weight of the body, which is nicely balanced upon it.

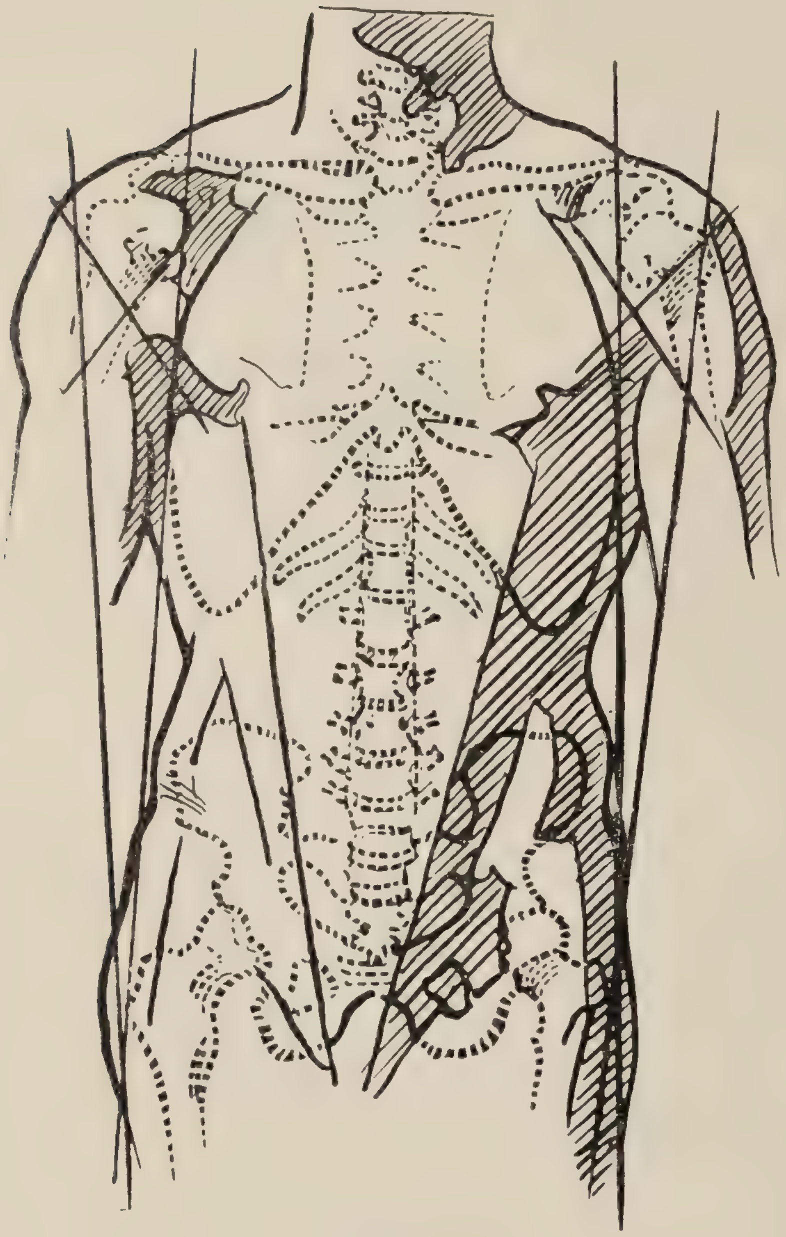

Figure 37

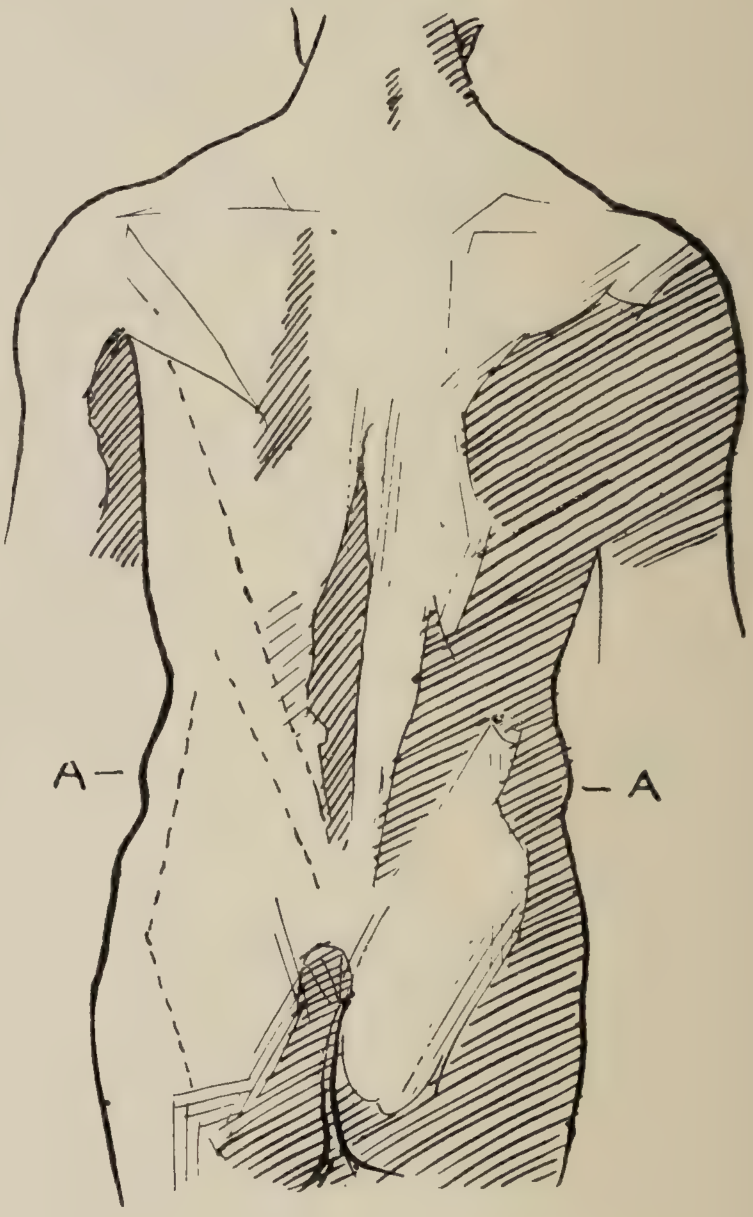

Figure 38

In the profile view of the trunk (Figure 36), note the angle of the three sections—how the chest A slants downward and forward, the farthest point forward being just below the hollow at the end of the sternum or breast-bone. The abdominal region B is almost vertical and much longer in front than in the back.

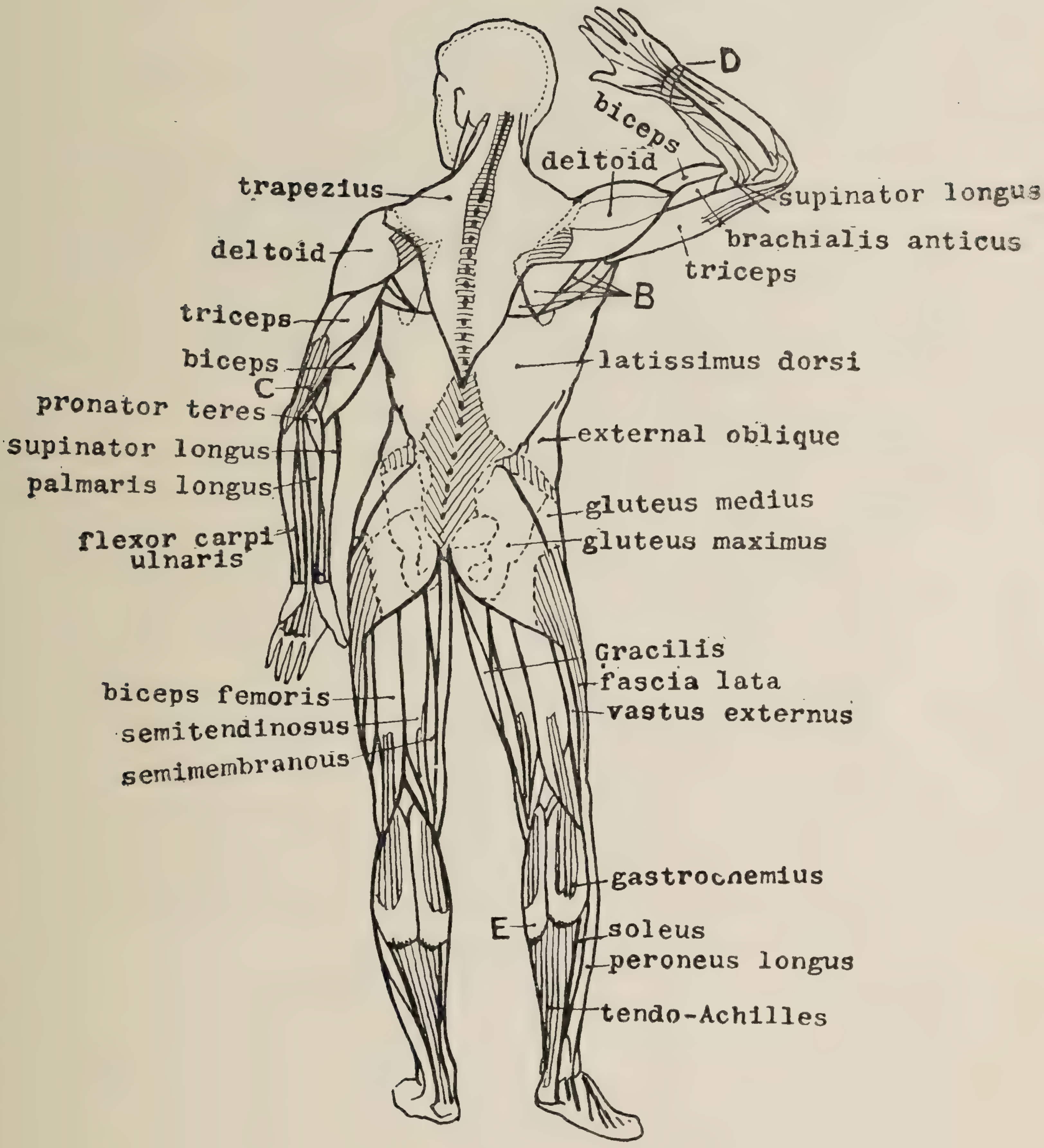
D
biceps
deltoid
trapezius
supinator longus
brachialis anticus
deltoid
triceps
B
triceps
biceps
latissimus dorsi
C
pronator teres
supinator longus
external oblique
palmaris longus
gluteus medius
flexor carpi ulnaris
gluteus maximus
Gracilis
fascia lata
biceps femoris
vastus externus
semitendinosus
semimembranous
gastrocnemius
E
soleus
peroneus longus
tendo-Achilles

Figure 39

The pelvic section C slopes downward and backward, completing the balance of the trunk. Note the variety of the curves in the back line of the pelvis and the muscular cushion D which falls well below the coccyx. The outline of this cushion, at the bottom of the seat, comes well forward at the finish of the curve to meet the leg.

The front view of the trunk (Figure 37) illustrates the double triangular form, consisting of the wide plane of the chest and shoulders at the top resting on the long wedge shape of the abdominal region, which fits into the crotch of the pelvic region. This wedge is supported on either side by the buttress formation of the hips, the whole structure being built to sustain the heavy weight of the upper part of the body.

In the back view of the trunk (Figure 38) the wedge formation will be noted where the back fits into the pelvic region, and also the same supporting buttress of the pelvis as pointed out in the front view.

There is a slight projection of muscle A caused by the external oblique muscles just over the iliac crests of the pelvic bones. This is one of the places on the body where the bone comes near the surface.

Directly below the pectorals will be found the external oblique muscles (Figures 39, 40, and 41). These are flat sheets of muscle attached above separately to the eight lower ribs and iliac crest, and merging into the sheet-like covering of the front of the abdomen. This covering extends from the lower end of the sternum or breast-bone to the lower front projection or pubis of the pelvic bones. The lower borders converge toward this centre in a wedge formation bounded at the sides by a cord-like ligament, which extends from the forward iliac crest to the pubis.

Below and at the side of the pectoral muscles will be seen a portion of the serratus magnus (Figure 40). This muscle is attached to the ribs in front and the shoulder blade at the back, and shows quite prominently when the chest is expanded.

Between the trapezius, the latissimus dorsi, and the deltoid muscle of the shoulder, in the back view, is a somewhat tri-

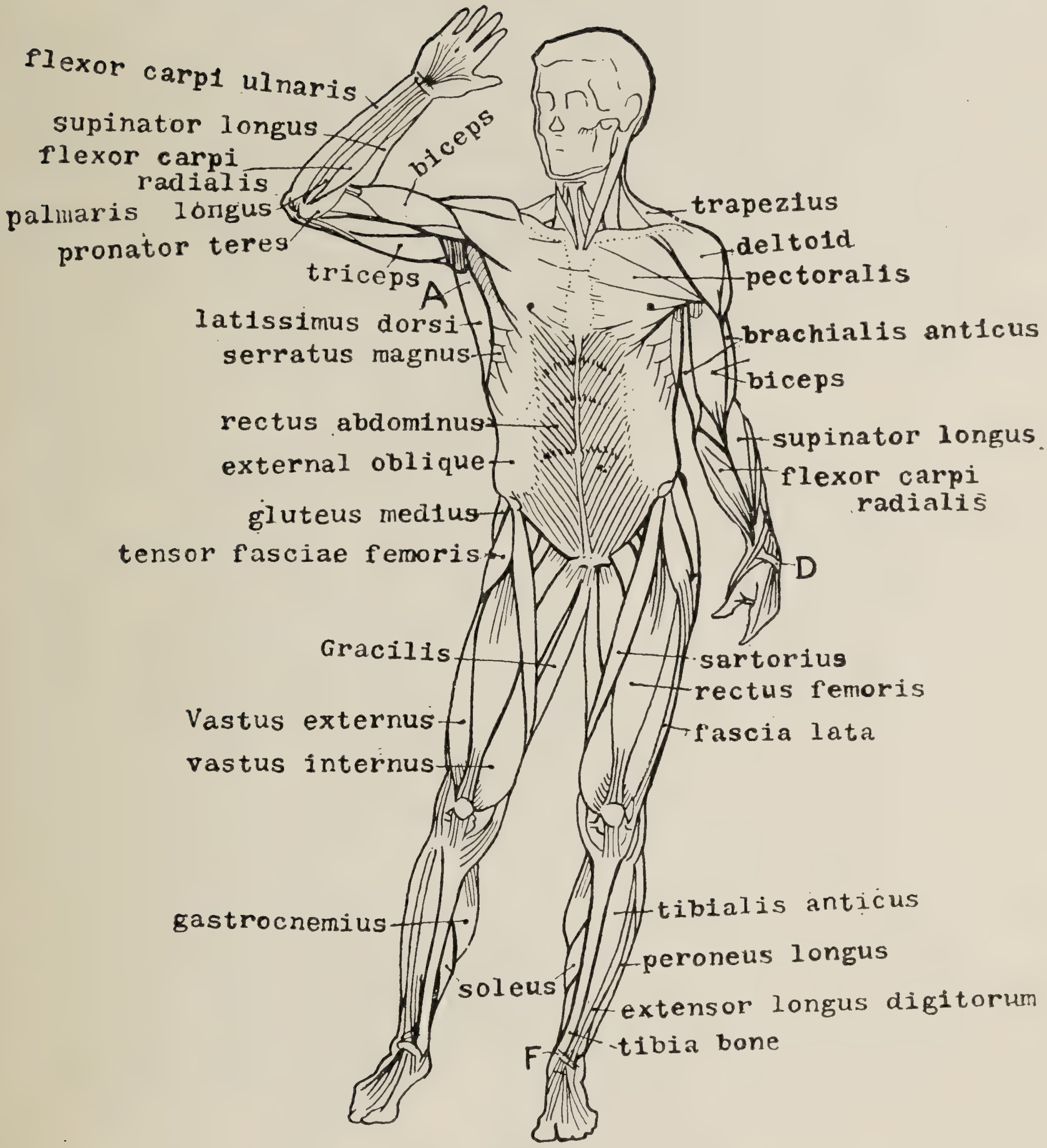
flexor carpi ulnaris
supinator longus
flexor carpi radialis
palmaris longus
pronator teres
biceps
triceps
A
latissimus dorsi
serratus magnus
rectus abdominus
external oblique
gluteus medius
tensor fasciae femoris
Gracilis
Vastus externus
vastus internus
gastrocnemius
soleus
F
trapezius
deltoid
pectoralis
brachialis anticus
biceps
supinator longus
flexor carpi radialis
D
sartorius
rectus femoris
fascia lata
tibialis anticus
peroneus longus
extensor longus digitorum
tibia bone

Figure 40

angular space, in which will be found four small but important muscles which need not be named, but the general direction and function of which should be noted. See the areas marked B in Figure 39 and Figure 41.

These muscles serve to connect the scapula with the upper arm and are used when the arm is raised. The outside one, the teres major, is attached to the arm with the latissimus dorsi.

Below and at the side of the attachments of the latissimus dorsi will be found the two large gluteus muscles, gluteus medius and gluteus maximus (Figure 39). A third muscle, the tensor fasciae femoris, works in conjunction with these two, but is only seen in the side view (Figure 41).

MUSCLES OF THE ARM

The first muscle of the upper arm to consider is the great deltoid muscle which forms the shoulder (Figures 39, 40, and 41). Its shape is that of an inverted triangle.

The most prominent muscle at the front of the upper arm is the biceps, which divides at the top into two heads.

Directly beneath the biceps, and visible on the outer side of it and slightly on the inner side just above the elbow, is the brachialis anticus. This is a broad muscle which covers the lower half of the front of the humerus and the front of the elbow joint.

The whole back of the upper arm below the deltoid is occupied by the triceps muscle (Figures 39, 40, and 41), which has three parts. The two main upper heads are inserted beneath the deltoid—one to the head of the humerus, and the long head to the scapula. A third and smaller head on the inner side of the arm also is inserted in the humerus. These three heads converge into a broad flat tendon (Figure 39), which is a very prominent feature at the back of the arm. It passes over the elbow and is inserted into the ulna.

Muscles of the Forearm

Owing to the rotary action of the forearm bones, the muscles of the forearm are complicated and interwoven. They are generally divided into two groups—the flexors and extensors—

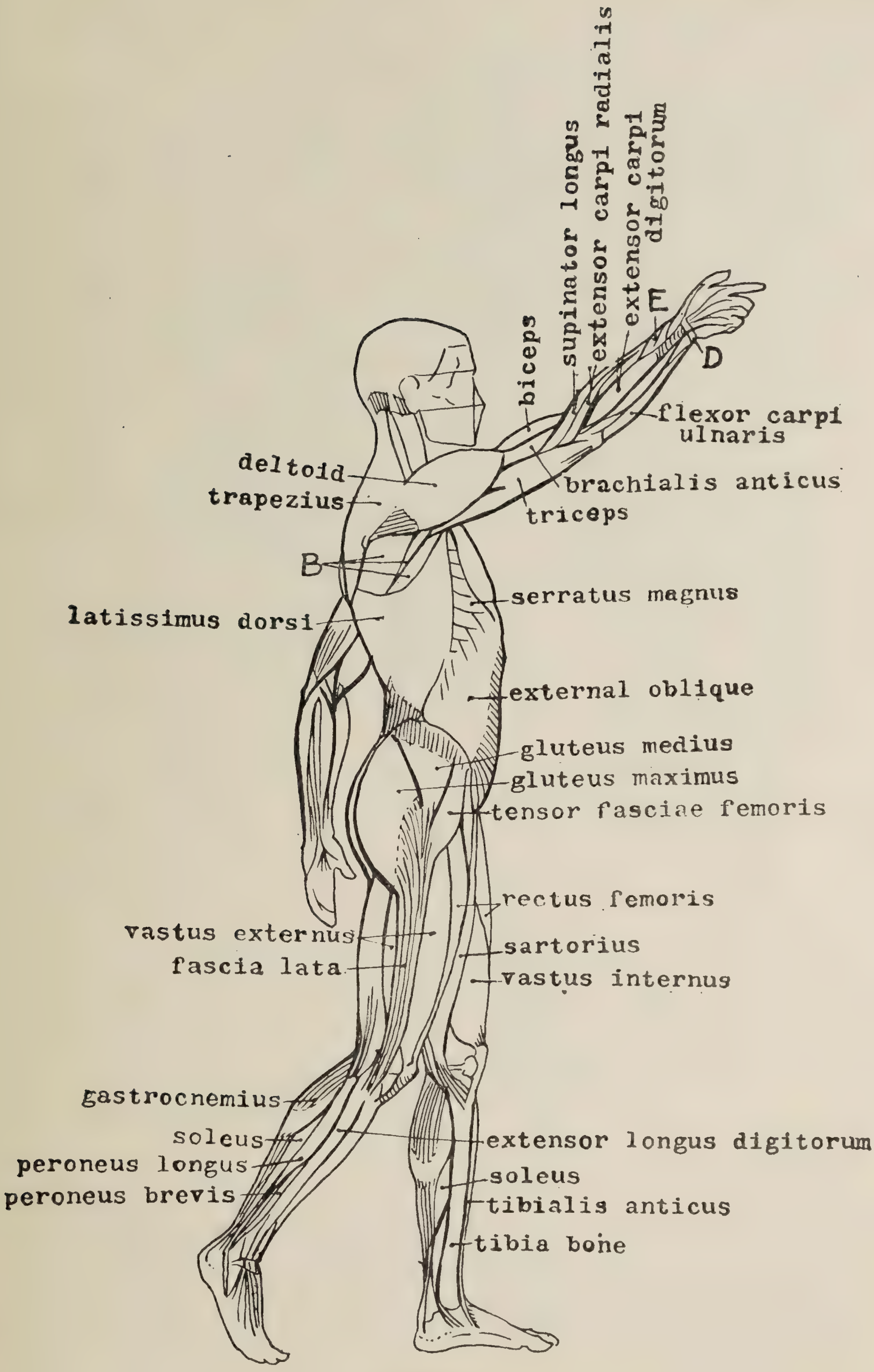
supinator longus
extensor carpi radialis
extensor carpi
digitorum
biceps
E
D
flexor carpi
ulnaris
brachialis anticus
triceps
deltoid
trapezius
B
serratus magnus
latissimus dorsi
external oblique
gluteus medius
gluteus maximus
tensor fasciae femoris
rectus femoris
vastus externus
sartorius
fascia lata
vastus internus
gastrocnemius
soleus
extensor longus digitorum
peroneus longus
soleus
peroneus brevis
tibialis anticus
tibia bone

Figure 41

which operate the hand and wrist by means of long tendons passing under the wrist band—a tendon which passes around the wrist (Figures 39, 40, and 41 D). Generally speaking, the flexors are at the front part of the arm and the extensors at the back. An exception to this is the supinator longus (Figures 39, 40, and 41), which, though not an extensor, is among the extensor group and is prominent on the thumb side of the arm.

In general shape the arm tapers from the shoulder to the wrist, but, though somewhat cylindrical in character like the human form in general, it has quite definite flat planes.

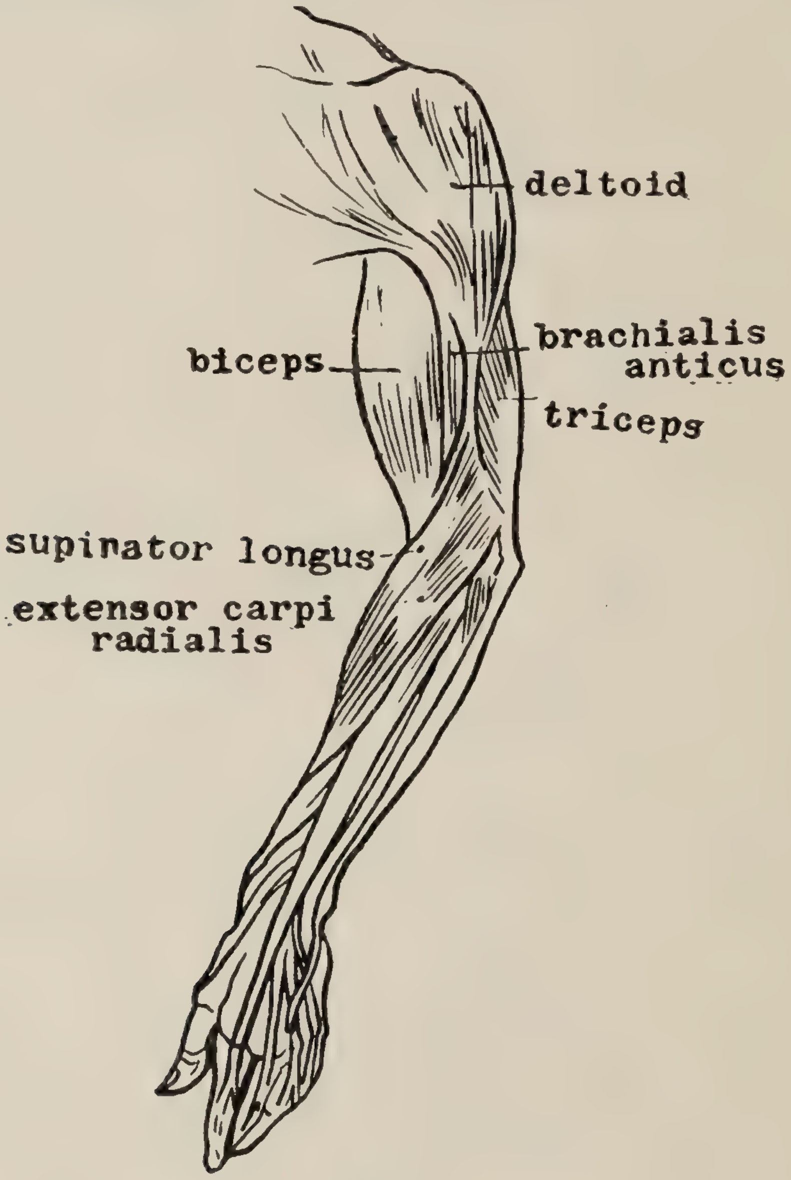

Figure 42

Figure 42 illustrates the general shape of the arm. Study the muscles as shown in this Figure and compare them with the arms in Figures 39, 40, and 41. Figure 42 shows especially well the passage of the forearm muscles from the forearm to the hand.

THE HAND

Figures 43 and 44 show the principal muscles of the hand, back and front. These muscles need only be considered

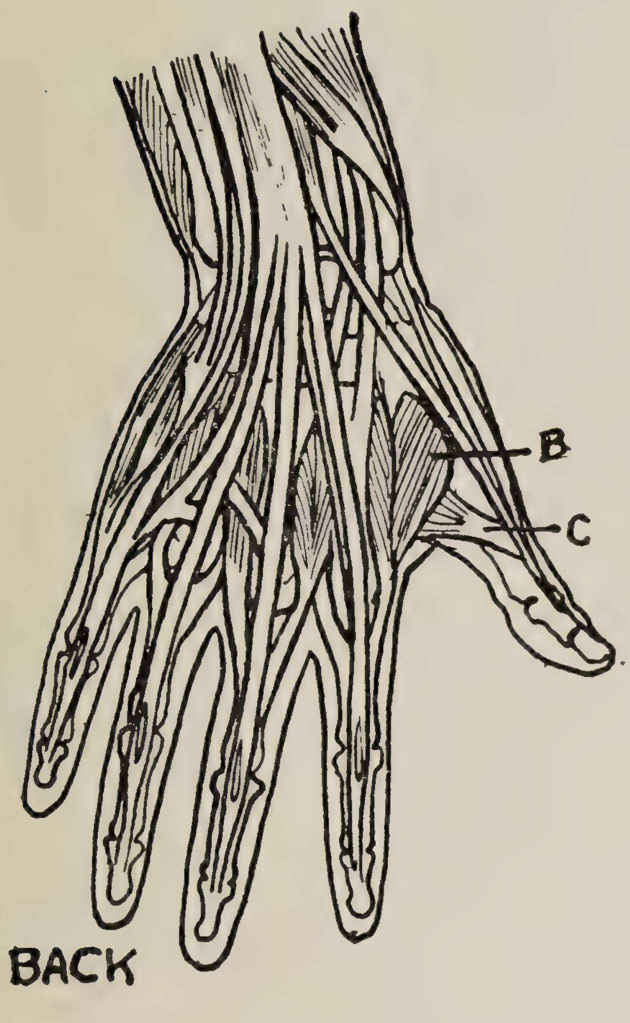

Figure 43

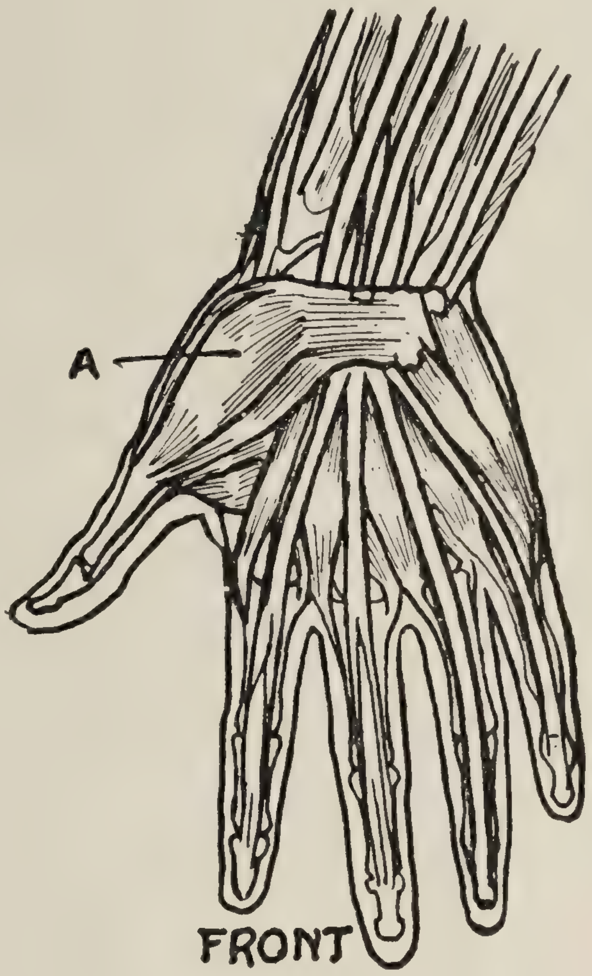

Figure 44

in a general way. In the back view the long tendons of the extensor muscles are quite prominent as surface forms which pass directly over the knuckles. The prominent muscles B and C, between the thumb and fore-finger, should be noted in this back view.

The front view shows the tendons of the flexor muscles which pass under the annular ligament at the wrist to the fingers. These tendons are not nearly so obvious on the surface as the extensors on the back. The muscle that forms the ball of the thumb A, makes a fleshy prominence which dominates the palm of the hand.

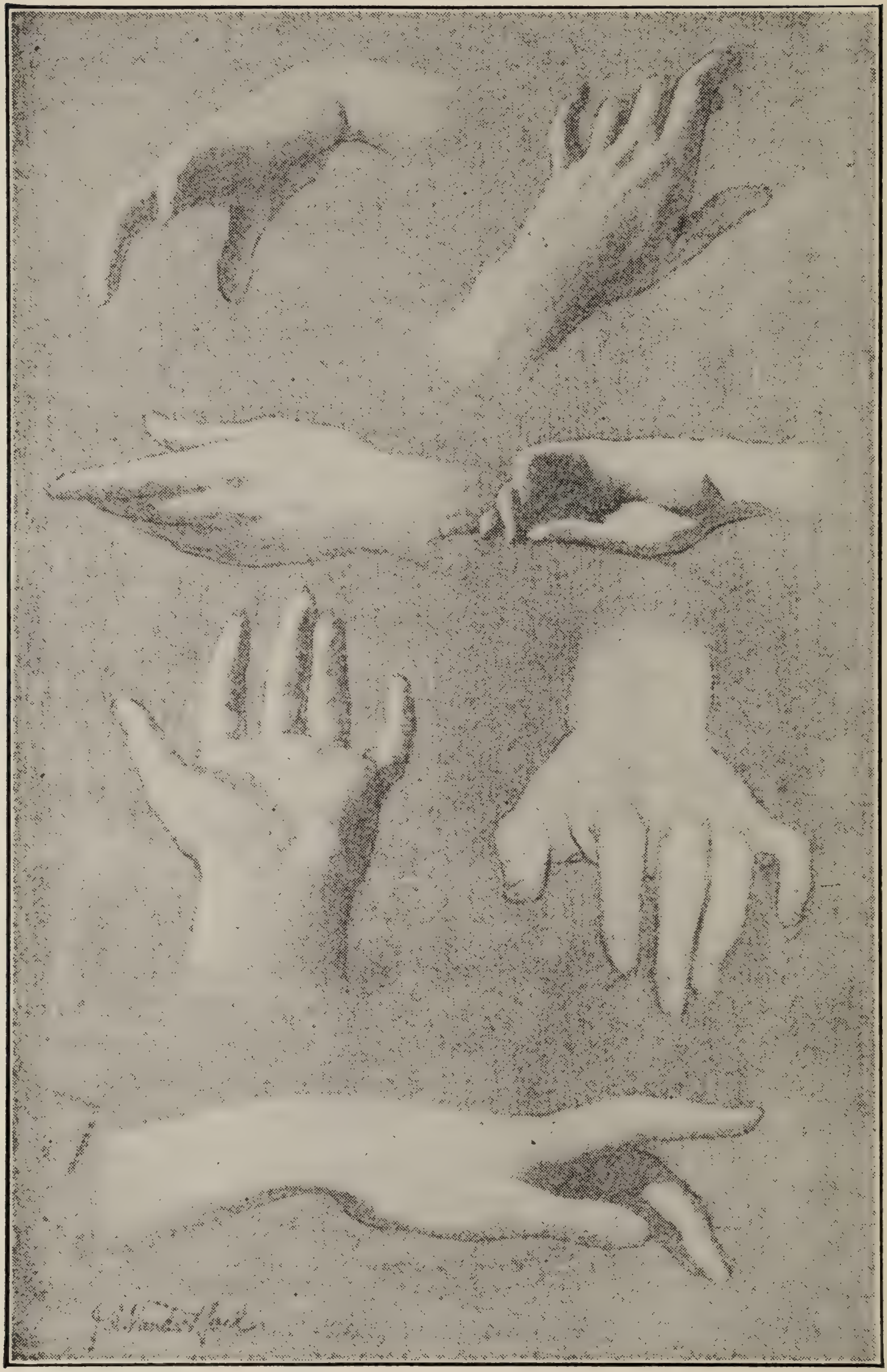

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Figure 45

The loose skin between the thumb and first finger is well worthy of study. Figure 46 shows that the skin line from the thumb passes between the skin lines from the palm and the back of the hand—all these lines going to the base of the index finger.

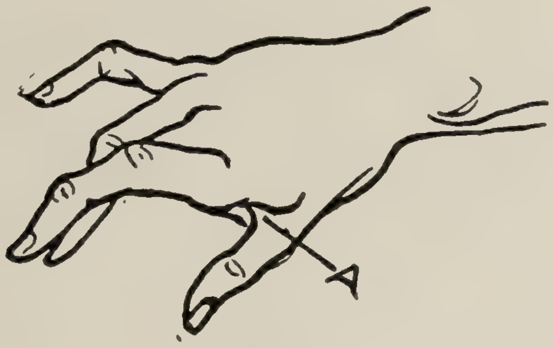

Figure 46

The illustrator should pay special attention to the hand, as it is one of the most expressive parts of the body and also one of the hardest to draw. The number of emotions that can be expressed by the hands is not often realized. The great actors make use of this means of expression, particularly in the purely pantomime field of motion pictures. They are the greatest aid to facial expression and action of the figure. Poorly drawn hands will spoil an otherwise excellent figure. Figure 45 shows a number of hands in different positions.

THE LEG AND THE FOOT

In the front view of the upper leg will be noted three large and prominent muscles. (See Figures 40 and 41.) Directly down the front extending from the pelvis to the patella or knee-cap is the rectus femoris, a large muscle with a fleshy centre and tendons at both ends the upper part of which is hidden. To either side and somewhat beneath this muscle are the vastus internus on the inside and the vastus externus on the outside.

These muscles are attached to the upper part of the femur and most of the way down. At the lower end they, with the rectus femoris, are attached to the patella or knee-cap, and also below it to the head of the tibia of the lower leg by a strong flat tendon. Note that the fleshy mass of the vastus internus is lower than that of the vastus externus, thus helping to cause the fleshy prominence on the inside of the thigh above the knee.

Extending from the outer side of the pelvis diagonally inward, passing over the knee, and attaching to the upper part of the inner surface of the tibia, is a long cord-like muscle called the sartorius. (See Figure 40.)

When the leg is in action, the upper portion of this muscle is quite prominent, and the whole lower part of the muscle causes a very important diagonal depression across the inner leg, which extends to the inner side of the knee.

Above the sartorius on the inside of the leg is a fan-like group of muscles rising at the crotch of the pelvis and spreading out the whole length of the shaft of the femur. (See Figure 40.)

At the outside top of the upper leg and extending down the side of the knee to the tibia, the gluteus maximus and the medius, which we have already studied in the back view, will be seen. (See Figure 41.)

At the back of the upper leg and extending from the pelvis to the head of the tibia is the biceps femoris (Figure 39). The upper part of this muscle is inserted under the mass of the gluteus muscles of the seat. Parallel to this on the inner side are two muscles—the semi-tendinosus and the semi-membranosus (Figure 39). These two muscles, after passing over the end of the femur, are inserted in the inner head of the tibia. These two, with the biceps femoris just mentioned, are the flexors of the leg and are known as the outer and inner hamstring muscles.

On the inside of the upper leg, seen from both back and front, is a long, narrow muscle which arises from the pubis at the crotch. It passes behind the sartorius and is inserted in the form of a long tendon at the head of the tibia. It is called the gracilis. (See Figures 39 and 41.)

Muscles of the Calf of the Leg

The broad double muscle which forms the outside mass of the calf is called the gastrocnemius. (See Figures 39, 40, and 41.) It arises at the lower end of the femur directly behind the knee joint in the hollow between the spreading of the two hamstring muscles. This muscle is divided at the top, but the two parts practically merge into a bulky mass. Just above the centre of the lower leg this muscle suddenly becomes a flat tendon called the tendo-Achilles, which narrows to the ankle, and slightly spreads again to where it is attached to the calcis or heel bone. (See Figure 39.) Note that the inside half of the gastrocnemius extends somewhat lower than the outer half. (See Figure 39, E.)

Immediately behind the gastrocnemius is a large flat muscle called the soleus. It arises from the back of the tibia and the fibula. This muscle rises beneath the gastrocnemius, and is visible below it on either side, but particularly on the outside of the leg from the back. (See Figure 39.) It merges with the lower part of the tendo-Achilles and becomes a part of it.

The Front of the Lower Leg

The tibialis anticus (Figures 40 and 41) arises from the top of the tibia, and extends in a long tendon under the band of the ankle to the metatarsal bone of the great toe. Running parallel to this muscle the whole length of the shin, the tibia or shin bone lies at the surface, its lower end forming the inside and outside ankles, which are also at the surface. (See Figure 40, F.) The inside ankle is considerably higher than the outside.

Just behind the tibialis anticus is a long, thin muscle, the extensor longus digitorum (Figures 40 and 41), which arises at the head of the fibula. It passes in a narrow tendon under the band of the ankle, and divides into four tendons which control the four outer toes. (See Figures 47 and 48.) The fifth tendon, to the end of the great toe, and a sixth to the outer side of the little toe, arise from interior muscles.

General Character of the Leg and Foot

Like the arm from shoulder to wrist, the leg tapers from the upper thigh to the ankle, but in a much greater degree. The thigh being much more heavily constructed than the upper arm on account of the great weight it has to support, carries a much larger bulk of muscle and bone, and the degree of taper is correspondingly greater. The same applies to the lower leg, the mass of calf being heavier than the muscles of the forearm.

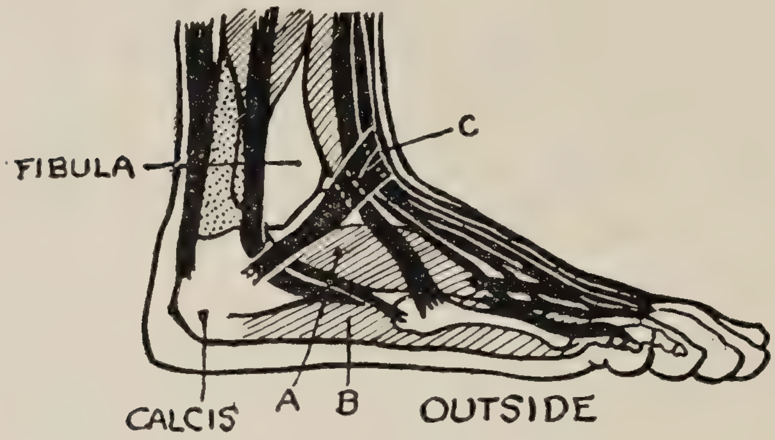

Figure 47

The general character of the profile of the leg is that of a double reverse curve, the knee being the point of reversal. The upper leg has a distinct forward curve, while that of the lower leg is backward. Note the backward angle of the knee and how it is balanced again by the forward sweep of the ankle and foot. It is the study of these angles that will give the proper balance to the standing figure, and enable the student to draw figures that are not stiff.

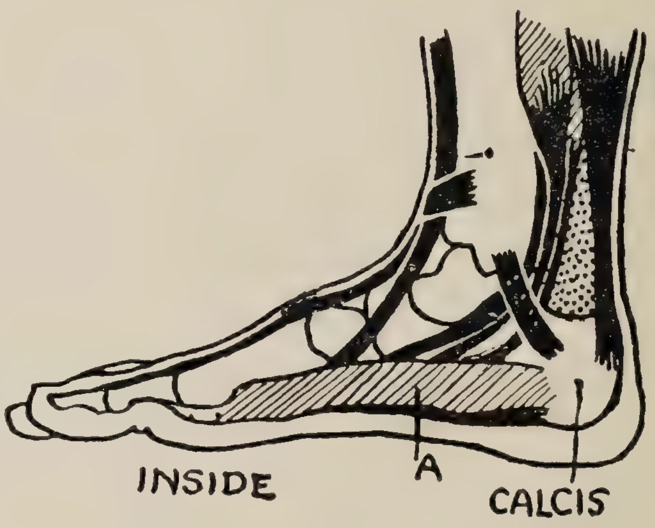

Figure 48

EXERCISES

1. Make a simplified drawing of a skeleton, naming the chief bones.
2. Make a drawing of the skull in the following views:
    (1) Front view
    (2) Side view
    (3) When looking up.
3. Make a number of sketches of figures in action, using constructions similar to those in Figures 5 and 6.
4. Draw a head from life in the following positions:
    (1) When looking straight in front
    (2) When thrown back.
5. Make drawings (self portrait) showing different expressions.
6. Make drawings of the eye as follows:
    (1) Looking to right
    (2) Looking to left
    (3) Looking upwards.
7. Make a drawing of the arm:
    (1) When extended
    (2) When bent at the elbow.
8. Show how the action of the figure is affected when:
    (1) Standing erect
    (2) When the one leg is in different action.
9. Draw three phases of a figure in the act of throwing a ball.
10. Show by sketches what takes place in the contour of the side view of the body:
    (1) When the chest is relaxed
    (2) When the chest is expanded.

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